United States Court of Appeals
for the
District of Columbia Circuit

TRANSCRIPT OF RECORD

APPENDIX TO APPELLANT'S BRIEF

United States Court of Appeals

DISTRICT OF COLUMBIA CIRCUIT

APPEAL No. 10,985

JOHN A. MARZALL, COMMISSIONER OF PATENTS,
APPELLANT

v.

JOSEPH L. SWITZER AND RICHARD A. WARD, APPELLEES

498

APPEAL FROM THE JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

E. L. REYNOLDS,
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J. SCHIMMEL,
Of Counsel.

United States Court of Appeals
For the
District of Columbia Circuit

FILED MAY 19 1951

Joseph W. Stewart
CLERK

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United States Court of Appeals

DISTRICT OF COLUMBIA CIRCUIT

APPEAL No. 10,985

JOHN A. MARZALL, COMMISSIONER OF PATENTS,
APPELLANT

v.

JOSEPH L. SWITZER AND RICHARD A. WARD, APPELLEES

APPEAL FROM THE JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

APPENDIX TO APPELLANT'S BRIEF

COMPLAINT FOR ISSUANCE OF A PATENT

(Action under Section 4915 R.S. 35 U.S.C. Sec. 63)

Plaintiffs herein for their complaint allege:

1

Plaintiffs, Joseph L. Switzer and Richard A. Ward, are citizens of the United States and residents of Cleveland Heights, Ohio and Nutley, New Jersey, respectively.

2

That defendant, Lawrence C. Kingsland, is Commissioner of Patents of the United States, is a citizen of the United States, and has his official residence as Commissioner of Patents in the District of Columbia, and is named as defendant in this Complaint in his official capacity as Commissioner of Patents of the United States.

3

That this is a suit brought under the patent laws of the United States, and more particularly under and pursuant to the provisions of Section 4915, R. S. of the United States, 35 U.S.C. Sec. 63, as amended.

4

That heretofore, to-wit, on February 13, 1942, plaintiffs, Joseph L. Switzer and Richard A. Ward, were the true, original and first inventors of certain new and useful improvements in "Fluorescent Textiles", not known or used by others in this country before their invention or discovery thereof and not patented or described in any printed publication in this or any foreign country and not in public use or on sale in this country prior to their invention or discovery thereof or for more than one year prior to their application for Letters Patent therefor, and for which invention no application for Letters Patent had been filed by them or their legal representatives or assigns in any foreign country more than twelve months prior to their application for Letters Patent of the United States, and which invention had not and has not been abandoned.

5

That being, as stated, the original, first and joint inventors of said improvements and entitled to a patent therefor, the said plaintiffs, JOSEPH L. SWITZER and RICHARD A. WARD, on or about the 13th day of February, 1942, duly filed in the United States Patent Office an application for Letters Patent on said invention, Serial No. 430,792, said application complying in all respects with the requirements of the law in such cases made and provided.

6

That the Primary Examiner of the United States Patent Office, to whom said application was assigned, finally refused allowance of the following claims in said application:

> 4. The process of dyeing to produce a daylight fluorescent fabric comprising the steps of providing a dye bath by dissolving a daylight fluorescent dye in a strong aqueous alcoholic solution, said dye being characterized by a greater solubility in alcohol than in water, immersing in the dye bath a fabric, characterized by its tendency to be swollen

by the aqueous alcoholic solution and to absorb said dye in a state akin to solution, maintaining the temperature of said dye bath below that which swells the filaments of said fabric to coalescence, and then flushing the fabric with cool water to remove said dye bath.

5. The method of dyeing a fabric as defined in claim 4 in which the alcohol in the aqueous alcoholic solution is substantially forty percent by weight.

6. The method of dyeing cellulose acetate fabric comprising the steps of providing a dye bath by dissolving a daylight fluorescent dye in a strong solution of a solvent and water, said dye being characterized by its lesser solubility in water than in said solvent in which solvent said dye, water and cellulose acetate are each soluble, immersing in said dye bath cellulose acetate fabric characterized by its tendency to be swollen to incipient coalescence by said dye bath, removing said fabric before coalescence, and then flushing said cellulose acetate with water to remove said dye bath.

7. The method of dyeing cellulose acetate fabric comprising the steps of dissolving a daylight fluorescent dye, characterized by a greater solubility in alcohol than in water, in a strong solution of alcohol in water to form a dye bath, immersing cellulose acetate fabric in said dye bath, said dye bath and said fabric being proportioned so that the maximum possible absorption of dye into said fabric cannot exceed 0.8%, by weight, of the fabric, maintaining said dye bath below that temperature at which said dye bath swells the filaments of the fabric to coalescence, and flushing said cellulose acetate fabric with cool water to remove said dye bath.

8. The method of dyeing cellulose acetate fabric to provide a daylight fluorescent fabric comprising the steps of providing a dye bath by dissolving a fluorescent dye derived from dialkylaminophenol in a strong aqueous solution of alcohol, said dye being less than two per cent, by weight, of said solution, immersing cellulose acetate fabric in said dye bath, maintaining said dye bath below the temperature at which the dye bath causes the filaments of the fabric to coalesce, and then flushing said cellulose acetate fabric with cool water to remove said dye bath.

9. The method of dyeing cellulose acetate fabric to provide a daylight fluorescent fabric comprising the steps of providing a dye bath by dissolving a fluorescent dye derived from monoalkylaminophenol in a strong aqueous solution of alcohol, said dye being less than two percent, by weight, of said solution, immersing cellulose acetate fabric in said dye bath, maintaining said dye bath below the temperature at which the dye bath causes the filaments of the fabric to coalesce, and then flushing said cellulose acetate fabric with cool water to remove said dye bath.

10. The method of dyeing cellulose acetate fabric to provide a daylight fluorescent fabric comprising the steps of providing a dye bath by dissolving a fluorescent dye derived from diethylaminophenol in a strong aqueous solution of alcohol, said dye being less than two per cent, by weight, of said solution, immersing cellulose acetate fabric in said dye bath, maintaining said dye bath below the temperature at which the dye bath causes the filaments of the fabric to coalesce, and then flushing

said cellulose acetate fabric with cool water to remove said dye bath.

11. As a composition of matter, a dyed fabric comprising a fabric of organic filaments and a daylight fluorescent dye dispersed in said filaments of said fabric, said dye exhibiting a lesser solubility in water than in an organic solvent for said dye and water, said dye being so arranged and oriented in said filaments of said fabric that said fabric exhibits daylight fluorescence.

12. As a composition of matter, a dyed fabric comprising a fabric of cellulose acetate filaments and a daylight fluorescent dye dispersed in said filaments, said dye exhibiting a lesser solubility in water than in an organic solvent for said dye and water, said dye being so arranged and oriented in said filaments of said fabric that said fabric exhibits daylight fluorescence.

13. As a composition of matter, a dyed fabric comprising a fabric of cellulose acetate filaments and a fluorescent dye derived from monoalkylaminophenol so dispersed and oriented in said filaments that said fabric exhibits daylight fluorescence.

14. As a composition of matter, a dyed fabric comprising a fabric of cellulose acetate filaments and a fluorescent dye derived from dialkylaminophenol so dispersed and oriented in said filaments that said fabric exhibits daylight fluorescence.

15. As a composition of matter, a dyed fabric comprising a fabric of cellulose acetate filaments and a fluorescent dye derived from diethylaminophenol so dispersed and oriented in said filaments that said fabric exhibits daylight fluorescence.

16. The process of dyeing to produce a daylight fluorescent fabric comprising the steps of providing an aqueous dye bath containing not more than two percent, by weight, of a daylight fluorescent dye in solution, immersing in said dye bath a fabric characterized by its tendency to absorb said dye in a state akin to solution and to be swelled by the dye bath, the weight of fabric immersed in said bath being proportioned to the weight of dye in said bath so that the maximum possible weight of dye which can be absorbed into said fabric will not exceed 0.8% of the weight of the fabric, maintaining said fabric in said dye bath until the dye has penetrated into the fabric in a state akin to solution, maintaining the temperature of the dye bath below that at which said dye bath swells the filaments of said fabric to coalescence, and then flushing the fabric to remove said dye bath.

17. The process of dyeing to produce a daylight fluorescent fabric comprising the steps of providing a dye bath by dissolving a daylight fluorescent dye in a strong aqueous solution of a mutual solvent for said dye and water, said solvent also constituting a swelling agent for the fabric to be dyed, immersing in said dye bath a fabric characterized by its tendency to absorb said dye in a state akin to solution, the weight of fabric immersed in said dye bath being proportioned with respect to the weight of said dye bath so that the maximum possible weight of dye which can be absorbed by said fabric will not exceed 0.8% of the weight of said fabric, maintain-

ing said fabric in said dye bath until said dye is absorbed into the filaments of said fabric in a state akin to solution, maintaining the temperature of said dye bath below the temperature causing incipient coalescence during the time said dye is being absorbed, removing said fabric from said dye bath and then flushing the fabric in cool water to remove said dye bath.

7

That in due time and in compliance with the laws and regulations in such cases made and provided, an appeal was taken from said final rejection to the Board of Appeals of the United States Patent Office, and the said Board of Appeals, after hearing the said appeal, as the plaintiffs submit, incorrectly and contrary to the law and the facts submitted to said Board of Appeals, affirmed the final rejection made by the Primary Examiner, and refused a patent upon the said application, as from duly authenticated copies of said application and of the aforesaid proceedings in the Patent Office will more fully and at large appear.

8

Plaintiffs further state that no appeal has been taken from said decisions of the Board of Appeals to the Court of Customs and Patent Appeals, Washington, D. C., or to any other higher tribunal, and no such appeal is pending or has been decided, and this bill is filed within the six months' period following the decisions of the Board of Appeals of August 11, 1948 and October 4, 1948, as required by law.

WHEREFORE, plaintiffs bring this suit under and in accordance with the provisions of the statute made and provided in such cases, and pray this Honorable Court:

1. To decree that plaintiffs, JOSEPH L. SWITZER and RICHARD A. WARD, are the true, first and joint inventors of the improvements described in said application and defined in said claims 4 to 17, inclusive, aforesaid, and are entitled to receive Letters Patent of the United States for such invention.

2. To authorize and direct the Commissioner of Patents to issue a patent on the claims aforesaid.

3. That summons addressed to the defendant, LAWRENCE C. KINGSLAND, issued out of this Court commanding him to appear and answer this complaint and to abide by and perform such order and decree as this Court may adjudge.

4. For such other, further, and alternate relief as equity may require.

JOSEPH L. SWITZER,
RICHARD A. WARD,
By ELY & FRYE,
ALBERT L. ELY, JR.,
Attorneys for Plaintiffs.

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* * * * * * *

Filed March 23, 1949. Harry M. Hull, Clerk.

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

Civil Action No. 597-49

JOSEPH L. SWITZER AND RICHARD A. WARD, PLAINTIFFS,

v.

LAWRENCE C. KINGSLAND, COMMISSIONER OF PATENTS, DEFENDANT.

W. W. COCHRAN, *Solicitor,*
United States Patent Office,
Washington 25, D. C.
Attorney for Defendant.

ANSWER TO COMPLAINT

To the Honorable the Judges of the United States District Court for the District of Columbia.

1, 2, 3. Defendant admits the allegations of paragraphs 1, 2, and 3.

4. He admits that on February 13, 1942 plaintiffs, claiming to be the true, original and first inventors of certain alleged new and useful improvements in Fluorescent Textiles filed in the Patent Office an application for patent thereon and in said application made averments corresponding to the allegations of paragraph 4. He denies for reasons hereinafter given that such allegations are sufficient to justify the issuance of a patent on said application. He denies that plaintiffs were the true, original and first inventors of the subject matter claimed in said application.

5. He admits that said application was duly filed on February 13, 1942 and was given Serial No. 430,792. He denies for reasons hereinafter given that plaintiffs are the original, first and joint inventors of the subject matter claimed in said application and denies that plaintiffs are entitled to a patent thereon.

6. He admits the allegation of paragraph 6.

7. He admits the allegations of paragraph 7, except the allegation that the affirmance of the rejection of claims 4 to 17, inclusive, of plaintiffs' application was incorrect and contrary to the law and the facts. He states that said claims are unpatentable in view of the following prior patents and for the reasons given by the Examiner in his Statement dated January 7, 1948 and in his Reply to Brief dated June 23, 1948 and by the Board of Appeals in its decisions dated August 11, 1948 and October 4, 1948, copies of which will be furnished at the trial:

Abel (Br.), 1,939, Nov. 15, 1906;
Rhodiaseta (Fr.), 579,896, Aug. 16, 1924;
Imperial (Br.), 412,952, July 5, 1934;
Ellis, 2,053,276, Sept. 8, 1936;
Paine et al., 2,089,413, Aug. 10, 1937;
Rivat (Fr.), 847,107, June 26, 1939.

Profert is hereby made of copies of the above cited patents.

8. He admits the allegations of paragraph 8.

* * * * * * *

Filed December 14, 1949. Harry M. Hull, Clerk.

IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

Civil Action, No. 597-49

JOSEPH L. SWITZER AND RICHARD A. WARD, PLAINTIFFS,

v.

LAWRENCE C. KINGSLAND, COMMISSIONER OF PATENTS, DEFENDANT

ORDER

Upon consideration of the fact that John A. Marzall succeeded to the office of Commissioner of Patents on December 2, 1949, in place of Lawrence C. Kingsland, who resigned, and it appearing that there is substantial need for continuing and maintaining the above-entitled action, now therefore it is this 13th day of December 1949

ORDERED that John A. Marzall, Commissioner of Patents be and he is hereby substituted as party defendant in place of Lawrence C. Kingsland, formerly Commissioner of Patents.

H. F. SCHWEINHAUT,
Judge.

Filed November 27, 1950. Harry M. Hull, Clerk.

IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

Civil Action, No. 597-49

JOSEPH L. SWITZER AND RICHARD A. WARD, PLAINTIFFS,

VS.

JOHN A. MARZALL, COMMISSIONER OF PATENTS, DEFENDANT.

MEMORANDUM OPINION

The process which plaintiff herein seeks to patent is that of dyeing fabric, particularly cellulose acetate, to obtain a daylight fluorescent fabric.

Briefly, he accomplishes this by dissolving a daylight fluorescent dye in a strong aqueous alcohol, or other solution of water and a solvent which swells the fibers of the fabric so that they will obsorb the dye, immersing the fabric in the dyebath, maintaining the temperature of the bath below that which swells the filaments of the fabric to coalescence, and then flushing the fabric with cool water to remove the dye bath.

The patent has been denied by the Patent Office on the ground that the various steps have been anticipated by prior patents, domestic and foreign. While it is admitted that plaintiff obtains improved results, it is contended that his process merely combines steps used in prior patents and uses materials already known to be effective in the dyeing of cellulose acetates.

While it is true that the materials used or one or more of the steps in plaintiff's process may be found in one or more of the patents to which defendant refers, none of the prior patents is such an anticipation that it bears "within its four corners adequate directions for the practice" of plaintiff's process,[1] nor do the combined references constitute anticipation under the test—"Would a man who was grappling with the problem solved by the patent attacked, and having no knowledge of that patent, if he had the alleged anticipation in his hand, have said: 'That gives me what I wish?' "[2]

The only one of the prior patents which specifically relates to a process of obtaining fluorescent effects on textiles is the Paine patent (#2,089,413), which provides a process for attaining fluorescence on wool and cotton materials under ultra-violent light, but plainly indicates that materials so treated have no fluorescence when viewed by daylight.

The Rhodiaseta patent (French), the chief disclosure of which was preliminary treatment of cellulose acetate fibers with certain substances not theretofore used for communicating to cellulose acetate an affinity for dyestuffs, mentions in two examples that the *color* obtained is "a very fluorescent rose." However, there is no clear and definite disclosure that textiles treated by the Rhodiaseta process are daylight fluorescent such as would constitute anticipation of plaintiff's invention, and nothing in the patent indicates that the originators were aware that fabrics treated by a variation of the process therein described would be daylight fluorescent.[3]

It is true that the fact that an applicant for patent is the first to combine prior art disclosures does not entitle him to a patent, where the combination is the result of mere mechanical skill applied to an idea or ideas previously disclosed and neither the means employed nor the result obtained are novel.[4] But patentability may be shown, although the invention rests, as do its claims, upon a combination of elements already known.[5] "The fact that a combination later appears to be a simple one does not necessarily negative the presence of a high degree of inventive genius."[6] So, too, a process based on a known procedure, merely omitting one step and making new and better use of the old instrumentalities to obtain an improved product,[7] and a process which reversed steps in a manufacturing process to secure an improved result,[8] have held patentable. The element essential to invention, however it may be manifested, is the "uncommon talent" which is the root of invention in a patentable sense.[9]

---

[1] *Dewey & Almy Chemical Co.* v. *Mimex Co.*, 124 F. 2d 986.
[2, 3] *Becket* v. *Coe*, 69 App. D.C. 51, 98 F. 2d 332.

I find that the plaintiff's process, while utilizing certain materials and processes made known by prior patents, attains a new result, namely, daylight fluorescent fabrics, or, at the least, substantially enhanced qualities of utility, namely, fluorescence of fabrics enhanced to a degree never before conceived of, and does exhibit the necessary spark of genius; and that therefore plaintiff is entitled to a patent.[10]

---

[4] *Electric Cable Joint Co.* v. *Edison Co.,* 292 U. S. 69.

[5] *Electrons, Inc.* v. *Coe,* 69 App. D.C. 181, 99 F. 2d 414.

[6] *Electrons, Inc.* v. *Coe,* supra citing *Webster Loom Co.* v. *Higgins,* 105 U. S. 580.

[7] *Lawther* v. *Hamilton,* 124 U. S. 1.

[8] *In re Butz,* 58 App. D.C. 354, 30 F. 2d 878.

[9] *Standard Oil Development Co.* v. *Marzall,* 181 F. 2d 280 (U.S. App. D.C.).

[10] *Becket* v. *Coe,* supra.

While the commercial success of a new development does not render a patent valid, the Supreme Court has stated that "in cases where the question of patentable invention is a close one, such success has weight in tipping the scales of judgment toward patentability." [11] In the instant case I find the widespread recognition by industry, government, and the public of the utility of materitls treated by plaintiff's process, and the fact that established firms have become licensees of plaintiff prior to his obtaining of a patent, sufficient to tip the scales in favor of patentability, if it be conceded that the question is a close one.

Counsel will prepare appropriate findings of fact, conclusions of law, and order.

R. B. Keech,
Judge.

November 22, 1950.

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[11] *Jungerson* v. *Ostby & Barton Co.*, 335 U.S. 560.

Filed December 13, 1950. Harry M. Hull, Clerk.

IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

Civil Action No. 597-49

JOSEPH L. SWITZER and RICHARD A. WARD, PLAINTIFFS,

vs.

JOHN A. MARZALL, Commissioner of Patents, DEFENDANT

FINDINGS OF FACT AND CONCLUSIONS OF LAW

1. This is a suit brought in due course under the provisions of Section 4915 R.S. (35 U.S.C. 63) in which plaintiffs seek the issuance of a patent containing claims 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17 of their patent application in suit, Serial No. 430,792, filed February 13, 1942, and entitled "Fluorescent Textiles", the same having been denied by defendant in proceedings before the Primary Examiner and the Board of Appeals in the Patent Office.

2. Plaintiffs' application in suit discloses daylight fluorescent fabrics dyed by a process of dissolving a daylight fluorescent dye in a strong aqueous alcohol or other solution of water and a solvent which swells the fibers of the fabric so that they will absorb the dye, immersing the fabric in the dyebath, maintaining the temperature of the bath below that which swells the filaments of the fabric to coalescence during the time of immersion, and then flushing the fabric with cool water to remove the dyebath. The preferred fabric

disclosed in the application is daylight fluorescent cellulose acetate.

3. The references cited by the defendant and relied upon at the trial, namely, British Patent Nos. 1,939 (of 1906), and 412,952; French Patent Nos. 847,107 and 579,896; United States Patent Nos. 961,241, 1,968,-819, 2,053,276, 2,089,413, and 2,182,964; and *Colour Index,* (Society of Dyers and Colourists, 1924) disclose materials and process steps utilized by plaintiffs, but none of said references, either singly or in combination, would suggest or teach plaintiffs' process or the daylight fluorescent fabrics obtained by plaintiffs, nor do any of said references indicate that the prior art was aware that changes in the prior art processes, as by omission of a process step or reversal of order of process steps, or substitution or addition of one step or steps of one known process in or to the steps of another known process, might produce a daylight fluorescent fabric.

4. Plaintiffs exhibited the uncommon talent, which is the root of invention in the patentable sense, in inventing their process and the product thereof, and said process and product are, therefore, patentable.

5. Plaintiffs achieved a new result by their process, namely, daylight fluorescent fabrics, or, at least, fabrics of substantially enhanced qualities of utility, namely, fluorescence enhanced to a degree never before conceived of and, in achieving said process and product, plaintiffs exhibited the necessary spark of genius entitling them to a patent for their invention.

6. Industry, government, and the public have recognized the utility of the plaintiffs' process and product and established firms have become licensees under plaintiffs' inventions prior to the grant of a patent therefor. If the question of patentability were close, such commercial success and recognition would establish patentability.

7. Claims 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17 in suit are patentable and plaintiffs have complied with the patent statutes in filing and prosecuting before the Patent Office the application in suit containing said claims.

CONCLUSIONS OF LAW

1. Where new and unexpected results are obtained, a process which is a new combination of old process steps and which required more than expected mechanical skill to effect, is patentable and the new and novel products of such a process are likewise patentable.

2. Patentability is not negatived by the fact that a process may later appear to be a simple one, or that the process omits one step of a known process or reverses steps of a known process, or combines known process steps, where the results obtained and the product thereof are new, novel, and improved to an extent never before conceived of by the prior art.

3. Commercial success and utility recognized by industry, government, and the public establish patentability if the fact of patenability should otherwise be closely questionable.

4. Plaintiffs, Joseph L. Switzer and Richard A. Ward are entitled to a patent containing the specifica-

tion and claims, namely claims 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17 of the application in suit.

R. B. KEECH,
Judge.

Filed Dec. 13, 1950. Harry M. Hull, Clerk

IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

Civil Action No. 597-49

JOSEPH L. SWITZER AND RICHARD A. WARD, PLAINTIFFS

vs.

JOHN A. MARZALL, COMMISSIONER OF PATENTS, DEFENDANT

DECREE

This cause came to be heard at this term, and thereupon on consideration thereof and all the evidence presented therein, it is this 13th day of December, 1950,

Ordered, adjudged and decreed that:

1. Defendant is hereby authorized to issue to plaintiffs Letters Patent of the United States upon plaintiffs' patent application Serial No. 430,792, filed February 13, 1942, and containing claims 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17 of said application on the filing by plaintiffs in the Patent Office of a copy of the adjudication herein and otherwise complying with the requirements of law.

2. Defendant be awarded his costs herein under Revised Statute 4915.

R. B. KEECH,
Judge.

* * * * * * *

Filed Feb. 10, 1951. Harry M. Hull, Clerk.

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

Civil Action No. 597-49

JOSEPH L. SWITZER AND RICHARD A. WARD, PLAINTIFFS

v.

JOHN A. MARZALL, COMMISSIONER OF PATENTS, DEFENDANT

NOTICE OF APPEAL

Notice is hereby given this 9th day of February 1951 that defendant John A. Marzall, Commissioner of Patents, hereby appeals to the United States Court of Appeals for the District of Columbia Circuit from the decree of this Court entered on the 13th day of December 1950 in favor of plaintiffs Joseph L. Switzer and Richard A. Ward, against defendant, John A. Marzall, Commissioner of Patents, the Court having decreed that defendant is authorized to issue to plaintiffs letters patent of the United States upon plaintiffs' patent application Serial No. 430,792, filed February 13, 1942 and containing claims 4 to 17, both inclusive.

E. L. REYNOLDS,
Solicitor, United States Patent Office,
Attorney for Defendant.

* * * * * * *

The claims fall into two categories, and I should like to point those out. They are method claims, and they are composition article claims.

The article claims are obviously of much broader scope than the process or method claims. If Your Honor will look at the element folder, on page 3, Claim 11, it defines:

> "As a composition of matter, a dyed fabric comprising a fabric of organic filaments and a daylight fluorescent dye dispersed in said filaments of said fabric, * * *"

Then it defines the dye as

> "exhibiting a lesser solubility in water than in an organic solvent for said dye and water, said dye being so arranged and oriented in said filaments of said fabric that said fabric exhibits daylight fluorescence."

The only materials defined in that claim are:

> "a fabric of organic filaments and a daylight fluorescent dye dispersed"

therein.

As to these article claims, my feeling is that since the British patents disclose identical materials and the identical method of application, the fabric must respond to the definition set forth in those article claims. The fabric produced according to the British process must respond to the definition of that claim.

In connection with these plans, I am afraid I have another piece of evidence which probably will be objected to. I have what you might say is the bible of the dyers industry, the Society of Dyers and Colourists, Color

Index, in which are listed the different colors by name, by number, method, preparation, discoverer of the particular dye, description of the properties, and methods of application. I hand this up to the Court and ask the Court to look at the left-hand side, under number 752. That is the color index number. On the extreme right, in the fourth paragraph, under, "Dyes," in the column, "Description — Properties — Mode of Application," there is the statement that acetyl-silk is dyed pink with a marked yellow fluorescence.

The COURT: I have not found it.

Mr. SCHIMMEL: It is directly opposite number 752, in the last column, under the heading, "Dyes," there.

The COURT: Oh, I see it.

Mr. SCHIMMEL: The last line reads:

> "acetyl-silk pink with a marked yellow fluorescence."

There is an acetyl-silk fabric which is dyed with the same kind of dye that the applicants are using—rhodamine dye—and it states that it has a marked yellow fluorescence.

To us—to me, at least, I should say—that is a complete anticipation of the article claims defined in the complaint. I urge that before Your Honor in this case.

* * * * * * *

Thereupon, GEOFFREY DONALD DANE was called as a witness and, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. ELY:

Q. Will you state your name, please?

A. Geoffrey Donald Dane.

Q. Your residence?

A. 9 Hagner Road, Beckenham, Kent, England.

Q. What is your occupation, Mr. Dane?

A. Company director.

By the COURT:

Q. Of what?

A. Printing ink and display colors.

By Mr. ELY:

Q. What is the name of your company?

A. Dane and Company, Limited.

Q. When was that company founded?

A. 1853.

Q. The profession that your company is engaged in is that of colorists? Did I understand you to say that?

A. Yes.

Q. You say you sell printing inks. For printing on what materials?

A. Practically every material there is—paper, plastics, fabrics, textiles. Practically any material that can be thought of.

Q. You are familiar with colors and look out for colors as such in your work, do you not?

A. That is my trade.

Q. Your company is now a licensee under British patent applications owned by the plaintiff, Switzer Brothers, here; is that correct?

A. Yes.

Q. Prior to your first connection with and seeing the Switzer daylight fluorescent colors, had you seen materials in England, the continent of Europe, or elsewhere that absorbed these daylight fluorescent colors which exist in the fabrics which are hung across the rail there, which fabrics we will introduce in evidence as Plaintiffs' Exhibit 2?

Mr. Schimmel: No objection.

The Court: No objection. That will embrace all of them? Seven, are there?

Mr. Ely: Six.

The Court: Anyway, it will be understood that they are Plaintiffs' Exhibit 2, and they are received in evidence, there being no objection.

> (The fabrics referred to were marked as Plaintiffs' Exhibit 2 and received in evidence.)

Mr. Ely: If it please the Court, I should like to leave just a sample of the plaid fabric in Exhibit 2. That is a very new fabric, and I promised my clients I would bring most of it back.

The Court: That is all right.

Mr. Ely: Will you read the question, please?

The Reporter: (Reading) "Question: Prior to your first connection with and seeing the Switzer daylight fluorescent colors, had you seen materials in England, the continent of Europe, or elsewhere that absorbed these daylight fluorescent colors which exist in the fabrics which are hung across the rail there, which fabrics we will introduce in evidence as Plaintiffs' Exhibit 2?"

The WITNESS: No.

By Mr. ELY:

Q. Do you mean by that, sir, that you have never seen fabrics with such brilliance?

A. I have never seen such brilliant colors before.

Mr. SCHIMMEL: May I ask how old the witness is?

The COURT: Yes.

By The COURT:

Q. How old are you, sir?

A. Thirty-six. May I make a remark there, sir? I might remark that my firm is a family firm, and my father has been in it considerably longer than me, and he would not believe his eyes when I showed him these colors when I first came back.

Mr. ELY: I think I will have to ask some leading questions.

Mr. SCHIMMEL: It is all right with me.

By Mr. ELY:

Q. As I understand it, Mr. Dane, your firm is importing pigments of the same colors as the fabric here.

Mr. ELY: Now, may I make an aside to the Court that we are not concerned about the pigments as such. The Switzers have developed a line of pigments for some colors.

By Mr. Ely:

Q. Your firm is importing into England the pigments of the same colors?

A. Yes.

Q. Will you explain to the Court the procedure necessary now in England, in connection with the importation of such pigments, which requires the establishment of the novelty of such pigments.

Mr. Schimmel: I object to that.

The Court: I think I will have to sustain that. He is testifying really what the law of England is.

Mr. Ely: Excuse me.

By Mr. Ely:

Q. Will you explain the procedure involved in importing daylight fluorescent pigments into England

Mr. Schimmel: I object to that, Your Honor.

The Court: What would be the probative value of that, so far as this case is concerned, sir?

Mr. Ely: I believe the witness will testify that before these materials can be imported into England, they must be checked in order to determine the novelty.

The Court: I will sustain the objection.

Mr. Ely: That is all with this witness on direct examination.

Mr. Schimmel: I have no questions.

The Court: All right. You may step down, Mr. Dane.

(The witness left the stand.)

Thereupon, JOSEPH L. SWITZER was called as a witness and, being first duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. ELY:

Q. Will you state your name, please?

A. Joseph L. Switzer.

Q. What is your occupation, Mr. Switzer?

A. I am vice president of Switzer Brothers, Incorporated.

Q. What are your duties as vice president of Switzer Brothers, Incorporated?

A. To direct research and conduct production development.

Q. In what field are you active, Mr. Switzer?

A. In the field of fluorescence and color.

Q. I hand you here a dye sample or swatch book. Will you identify it and explain it to the Court?

A. This is a color card produced by Ciba, of Basle, Switzerland. It gives swatches of various dyes properly dyed on to fabrics. Included among those dyes are various types of rhodamine. The date of this folder is not given, but it is obviously a very old folder.

Q. Mr. Switzer, from the opening statement it appears that there is no issue between the parties that as to the fabrics for which you are——

Mr. ELY: Excuse me. There is one other question before we get into that.

By Mr. ELY:

Q. You are one of the joint inventors of the application in suit; is that correct?

A. I am.

Q. I will rephrase the question.

From the opening statement, it is apparent that there is no issue between the parties that some of the dyes that are used to produce the daylight fluorescent fabrics you are claiming, as shown by Exhibit 2, are old dyes. Nor is there any contest or question that the cellulose acetate fabric which is dyed by the dyes is as a raw fabric an old fabric.

Will you please explain to the Court in your own words what you believe is novel about the fabrics you are claiming?

A. Yes. The fabric, in the case of our daylight fluorescent effects, contains the dye in a different state of molecular distribution than does most fabric which is dyed by the ordinary processes.

Daylight fluorescent dyestuffs have been known for many years, but their property of daylight fluorescence is not apparent in the crystalline or solid state of the dye.

If you look at the powder—the dye itself as a powder—it has brilliant selective color reflection and absorption, but exhibits little or no fluorescence, even when exposed to intense ultra-violet radiations in the dark.

When such dyes are put into a solvent, or dissolved, and the concentration of the dye is brought to a relatively dilute stage, then you see, in addition to the color, a brilliant secondary effect, which is due to the fluorescence of the dye. That dyestuff, in other words, must be in a state of solution in order to exhibit the combined effect of color plus efficient fluorescence.

Now, the nature of the solvent—the chemical nature of the solvent—has a great deal to do with the fluorescent effect. It is possible to dissolve a fluorescent or daylight fluorescent dye without having the solution possess daylight fluorescence.

The concentration of dye in the solution is another important factor as to whether or not the dye will show the combined effect of color and daylight fluorescence. In other words, if you dissolve a daylight fluorescent dyestuff to the extent of one percent in a solution of alcohol, it exhibits powerful color and is augmented by daylight fluorescence. If you dissolve 10 percent of the same dyestuff in the same solution, it exhibits powerful color but little, if any, fluorescence.

One of the reasons why we think that happens is that the space or the distance between the dye molecules is not sufficient, so the energy of excitation is dissipated as heat rather than allowed to be converted into light which would be emitted.

Q. Perhaps you can explain that by reference to the drawings in the application, our Exhibit 3. It is also Exhibit K of the drawings of the patent application.

A. Figure 1.

Q. Will you explain that matter of the arrangement of the dyes with respect to the filament as shown by the drawing?

A. Yes, I will. Figure 1 shows a cross-section of a textile filament. The small circles that you note represent a dyestuff which has been exhausted on to that fiber from an extraneous solution.

Figure 2 shows relatively the same number of dye molecules, but they are uniformly, or quite uniformly, spaced throughout the filament rather than concentrated or closely spaced together on the surface.

Keep in mind that the same number of dye molecules may be involved in either case, and the same filament may be involved in either case.

Q. With reference to the figures, which one could be daylight fluorescent, and which one not daylight fluorescent, Mr. Switzer?

A. Figure 2 would be daylight fluorescent if the dyestuff selected exhibited such a property.

In Figure 1, even though the dyestuff in solution exhibited such a property, it would not be fluorescent to any great degree in that state of affairs.

Q. Now, with reference to Exhibit 3, which we would like to introduce in evidence——

Mr. SCHIMMEL: Which is that?

Mr. ELY: This is Ciba.

Mr. SCHIMMEL: I think I will object to that, Your Honor. There has been no real identification of this exhibit. We have no date on it. We know nothing about it except that it has been brought here.

The COURT: Have you any further way of supplementing the testimony, Mr. Ely, with reference to that? It is apparent that we will not finish today, so let it be marked as Plaintiff's Exhibit 3 for identification. Then, if you find that you can properly explain it and wish to reoffer it, we will deal with it then.

(The Ciba chart was marked as Plaintiffs' Exhibit 3 for identification.)

The WITNESS: It can be identified.

By Mr. Ely:

Q. Turning to swatches 22 and 23, will you explain to the Court the dyes that are used in dyeing the fabric shown there?

A. The dyestuff used in dyeing Sample 22 of this exhibit is Rhodamine B Extra, also known as Rhodamina B Extra, a three-tenths of one percent dyeing. That percentage, sir, means the amount of or the weight of the dye used in respect to the weight of fabric. That dyestuff is the identical dye used, in approximately the same proportion, on the neon red fabric exhibited prior to this.

Q. Well, you have a swatch in your hand?

A. I have a swatch of that fabric.

Mr. Ely: I offer that in evidence as Plaintiffs' Exhibit 4.

Mr. Schimmel: No objection.

The Court: It will be received.

(The swatch of fabric referred to was marked as Plaintiffs' Exhibit 4 and received in evidence.)

The Witness: In making a visual comparison in daylight, it is evident that the two effects are tremendously different. In making a black-light examination, we subject both of these samples to the influence of filtered ultra-violet light.

By Mr. Ely:

Q. Here is an ultra-violet light unit.

A. You will see that one possesses an extreme brilliance of fluorescence, and the other exhibits a very, very minor degree—practically unnoticeable.

Now, the major difference between the rhodamine dyestuff on the non-fluorescent sample as contrasted to the dyestuff on the daylight fluoresence fabric of our exhibit is the condition or the state which the rhodamine takes within the fiber.

In the case of the non-fluorescent material, the rhodamine is concentrated on the external or outer surfaces of the fiber. In the case of the daylight fluorescent sample, that same amount of rhodamine is uniformly distributed throughout the entire fiber.

I would like to clarify one of the reasons why the dyestuffs that are normally used in the practice of dyeing have a decided tendency to concentrate on the outer surfaces of the fiber. Dyeing as a process is generally one of dissolving a dyestuff in a water solution and of immersing in that solution a fabric which is known to have an affinity, as it is called, for the dyestuff. The dyestuff is slowly withdrawn or exhausted from the solution on to the fiber and is irreversibly fixed, due to that strange affinity that it might have for the fiber. When the dyestuff is exhausted from the solution and is on the fabric, the dyeing is finished. In that case, they simply rinse off the detergents, and the color is completely on the fabric.

That is a process which is the most well known and the most universally used process of dyeing—withdrawing or exhausting the color from the bath onto the fiber. When you are coloring a fabric with a dye which does not have very much affinity, you apply the dye onto the fiber. You exhaust it by forcing it onto the fiber by using a very high percentage of inorganic solvent that drives it out of the solution onto the fiber temporarily, and then fixing agents are used to permanently fix the dye onto the fiber—to irreversibly fix it. In that case, you never wash the fabric until after you have fixed it permanently onto the fabric. Otherwise the job of getting it onto the fabric from the solution would have to be done all over again. It would back right off, as we call it.

Q. Now, you have compared the colors of the daylight fluorescent swatch in Exhibit 4 and the swatch of Exhibit 3—swatch 22. Can you demonstrate briefly to the Court how one can identify a daylight fluorescent fabric very simply and positively, and also show the Court that the daylight fluoresenct fabrics are exhibiting color in the normal fashion and also responding by way of fluorescence to visible light?

A. Yes, that can be done. That can be done by using heat on the fabric. Heat destroys the ability of a dyestuff, even in a state of solution—of a daylight fluorescent dyestuff, even in solution. It destroys its ability to fluoresce. It does not destroy its ability to selectively reflect color.

Now, this daylight fluoresence fabric effect seen is composed of the two effects operating simultaneously. By bringing the temperature of this fabric up to around 300 degrees, we can temporarily show you just the color without the fluorescence. The minute the fabric cools back down, you will have both the color and the fluorescence.

You will notice that when you see the color alone without the fluorescence, then it is very similar in hue and dullness—comparative dullness—to the color on plaque number 22 of Exhibit 3. We have to do this carefully, sir, because we are liable to melt the fabric if we go too far.

As I cool it back down, it comes right back to shape. As it cools back down, we get composites. When you apply heat, you get a single effect, because heat destroys its ability to fluoresce, but it does not destroy its ability to exhibit color.

Q. You explain you have to have dye in a state akin to solution. Will you explain to the Court briefly, and in your own words, how you achieve this effect of getting the dye into this cellulose acetate fabric?

A. Yes. First, I select a dyestuff which exhibits daylight fluorescence in liquid solutions. Then, I also select such a dyestuff that has greater solubility in organic solvents than in water.

Q. What kind of organic solvents?

A. Particularly alcohol. I select alcohol because it is a better solvent for the dyestuff than water, and it is a solvent also for the cellulose acetate fiber. In view of the fact that it is a complete solvent for cellulose acetate fiber, it must be diluted down with water to a point where it will not completely coalesce the fiber or completely dissolve it, but will go into it in the manner of a plasticizer and increase the volume of the fiber practically a hundred percent.

I dissolve enough dye in this dye bath or in this aqueous alcohol. I dissolve the amount of dye in respect to the weight of the dye bath that I want in the cloth. If I want one percent of dye in the cloth, I generally select one percent of dye in the dye bath.

Now I immerse the cloth—the cellulose acetate cloth—in this strong aqueous alcohol bath and allow the cloth to absorb its own volume of the dye and aqueous alcohol combination.

After that stage it is very important to move the solvent without allowing the dye to move back to the surface of the goods or to leach out during the process of removing the solvent. This can be done if you use profuse amounts of cool water. The cool-water flushing removes the alcohol and leaves the dyestuff in the fiber in the same manner that it was in there when the mutual solvent was present. It does not concentrate the dye at the surface, nor does it leach the dye, because I have purposely selected a dye which was more soluble in the alcohol than it was in the water.

Upon doing that you have a dyestuff in a state which we describe as akin to solution in the fiber. The dye molecules are uniformly spaced throughout the fiber and not concentrated in and around the surface of the fiber.

I believe that is the primary reason why we get this unusual difference in effect.

Q. Mr. Switzer, there is one thing I want to bring out here. You state you flush with cool water. What would happen if you used warm or hot water?

A. If you used warm or hot water, the temperature of such water would immediately cause the solvent—the strong solvent solution—to coalesce or destroy the goods. Furthermore, it would tend to pull out the dye which you were so laboriously trying to put in in a special way before the goods had a chance to shrink or de-expand, so to speak.

Q. What is the state of the filaments at the time you subject them to the cool flushing?

A. The state of the filament is one of being swollen to practically twice its volume, one which is so highly plasticized that it could be stretched very easily, like rubber, almost, to the stage of coalescence or fusion by solvent action, but not quite.

Q. Will you explain to the Court the first practical use which was made of your daylight fluorescent fabric?

A. The first use was on stage in theatrical extravaganzas.

Q. What was the advantage of your fabric there?

A. Well, prior to the use of these fabrics, painted fabrics were used. Fluorescent pigments contained in varnishes, or fluorescent dyes contained in varnishes, were applied either by brush or spray gun onto the fabric, because direct dyeings of fluorescent dye on fabrics were not sufficiently fluorescent for acceptability by the stage. It had to be a painted fabric, and those were stiff, lacked drape, and were uncomfortable to wear.

So we wanted to get maximum black-light fluorescence in the textile itself, and we were able to accomplish that with this process. The stage industry, if you can call it an industry, accepted these new fabrics as something very fine indeed for their black-light extravaganzas.

Q. What was the next practical use of your fabric?

A. High color visibility signaling during World War II.

The Court: How much longer do you expect to be?

Mr. Ely: I think we could stop at any time.

The COURT: When you come to a convenient place, we will stop. Is this convenient for you?

Mr. ELY: Yes, sir.

The COURT: We will recess, then, until tomorrow morning at 10 o'clock.

Mr. ELY: Thank you.

(At 4:05 p.m., an adjournment was taken until Thursday, November 16, 1950, at 10 a.m.)

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

Civil Action No. 597-49

JOSEPH L. SWITZER AND RICHARD A. WARD, PLAINTIFFS

v.

JOHN A. MARZALL, COMMISSIONER OF PATENTS,
DEFENDANT

Washington, D. C.,
Thursday, November 16, 1950.

The trial of this case was resumed before District Judge Richmond B. Keech in Civil Division No. 6 at 10 a.m.

APPEARANCES:

On behalf of the plaintiffs: Mr. Albert L. Ely, Jr.

On behalf of the defendant: Mr. Joseph L. Schimmel, Assistant Solicitor, United States Patent Office.

PROCEEDINGS

The COURT: Are you ready to proceed, sir?

Mr. ELY: Yes, sir. Your Honor, in view of the way the opening statement went, and the fact that the key issue is whether or not Abel and Dreyfus, referring to the position of the Patent Office, had the same process as the applicants, and therefore must have produced the same fabric, after studying the Dreyfus patent yesterday we called Mr. Richard Ward, the other co-inventor in this case, in Cleveland, and told him about the Dreyfus patent. Mr. Ward last night or late yesterday afternoon ran a test of that and has come on to Washington today, interrupting a whole course of business that he is on. So if it is acceptable to Your Honor, we should like to interrupt the testimony of Mr. Joseph L. Switzer.

The Court: Is there any objection?

Mr. Schimmel: I have no objection.

Mr. Ely: Then, we will call Mr. Ward to the stand.

Thereupon, Richard A. Ward was called as a witness and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Ely:

Q. Will you state your name, please?

A. Richard A. Ward.

Q. What is your residence?

A. 1117 Allston Road, Cleveland Heights, Ohio.

Q. What is your occupation, Mr. Ward?

A. Chemist.

Q. For what company?

A. Switzer Brothers, Incorporated.

Q. You are the Richard A. Ward who is a co-inventor of the application in suit here?

A. That is correct.

Q. I hand you here some samples of fabric. Will you please tell the Court what they are and identify them? I shall identify this sample as Exhibit No. 5.

A. Well, these three samples are samples of acetate—that is, cellulose acetate—cloth which has been treated according to the methods—respective methods of Dreyfus, Switzer, and Abel.

Mr. Ely: I wonder if we could mark on the labels here, please, "5-A," "5-B," and "5-C," so that we can identify each sample. We will get them in the proper order.

By Mr. Ely:

Q. Identifying the swatches on Exhibit 5—that is, 5-A, 5-B, and 5-C—will you tell the Court which of the swatches was dyed according to the Abel process?

A. That is 5-A.

Q. Which one was dyed according to the Dreyfus process?

A. That is 5-B.

Q. Which one was dyed according to the Switzer process?

A. That is 5-C.

Q. What is the difference between the three processes? In other words, Mr. Ward, tell how you dyed Exhibit 5-A according to the Abel process.

Excuse me. Did you do the dyeing yourself?

A. Yes, I did it myself; that is correct.

Q. All right.

A. I first prepared a dye solution which consisted of 1,340 c.c. of 95 percent alcohol and a number of c.c. of water—that is, 2,000 minus that figure in water, so that the total number of c.c. was 2,000. Now, that corresponds to 63 percent alcohol by volume.

Then, to that alcohol—that aqueous alcohol—I added 20 grams of rhodamine B. Now, we have identified that in our patent application, I believe, as a metadiethyl amino phenolphthalein hydrochloride.

After the dye was dissolved, the solution was brought to 80 degrees Fahrenheit, and then three pieces of white cellulose acetate satin were immersed in this solution. After a few moments one of them was taken out and passed between a set of rolls.

Q. Excuse me, Mr. Ward. Which one was that?

A. That was the Dreyfus.

Q. Exhibit 5-B?

A. Exhibit 5-B. It was passed between a set of rolls which exerted a padding effect on the dye. It is equivalent to padding as far as the amount of dye introduced. Padding involves passing the cloth through a solution and then through a set of rolls which squeezes the solution into the fabric and at the same time removes excess solution. The cloth which is to be Exhibit 5-B was then hung up to dry.

The other two cloths were left in the solution for 15 minutes. One of them, which is to become Exhibit 5-A, the Abel example, was removed from the solution and allowed to dry.

The third one was flushed thoroughly with cold water and then hung up to dry.

Q. Mr. Ward, we have here a black light. Will you hang the exhibits 5-A, 5-B, and 5-C on the black light, so that the Court may have visual comparison of the relative fluorescence of the samples?

A. The light is equally effective. It has a tubular element.

Q. The one in the center is Exhibit 5-C; is that correct?

A. That is correct.

Q. That is the one dyed according to the Switzer process?

A. Yes.

Mr. ELY: That is all.

CROSS-EXAMINATION.

By Mr. SCHIMMEL:

Q. Mr. Ward, I believe you said you took the Exhibit 5-B, which was, according to your opinion, made according to the disclosure in the Dreyfus patent, out after a short time of immersion in a bath. Will you give us an idea how short?

A. Yes, approximately—well, I would say about half a minute, not any more. Between 15 seconds and half a minute. Just enough to give the dye a chance to thoroughly wet the cloth.

Q. What was the temperature of the dye bath?

A. 80 degrees Fahrenheit.

Q. You considered that to be room temperature, I suppose?

A. Well, it is very important in this process that it be close to 80. It is not exactly room temperature; it is a little bit above. For example, we cannot dye at 65 degrees or 70 degrees.

Q. According to Abel, he said to dye at room temperature, didn't he?

A. Well, you see, I am not too familiar with Abel. I just carried out—I dyed these all at the same time. It is close to room temperature.

Q. Let us assume, then, this: As a person experienced and skilled in the art, you would consider that to be substantially room temperature, in your opinion?

A. It is substantially room temperature, especially so in relation to ordinary dyeing techniques, which are carried out in almost all cases at elevated temperatures of 80 up to 200.

Q. Were Exhibits 5-A and 5-B washed afterward?

A. No.

Q. Isn't it common practice to wash even after drying?

A. Well, yes, it is common practice. It depends on your objective. In some cases, with dyes that are very difficult to take on, it is also common practice to dry them up or in some cases to give them special rinses or mordanting treatments.

Q. That is not common with silk, is it?

A. Mordanting? Yes, it is very common.

Q. It is common with silk?

A. Yes.

Q. But you do say it is common in dyeing to rinse after drying?

A. Oh, yes.

Q. In your opinion, do you think there would be any difference in the results if you had rinsed after drying?

A. Do you mean in the case——

Q. In the case of Exhibits A and B.

A. Well, no. I think that it depends on the—The one that was lifted out immediately would give weaker dyeing. That is the Dreyfus. It would give a weaker dye if it were rinsed than if it were dried up—that is, padded and dried up, the way it was.

Q. On the basis of the theory that you have advanced in your application, that the solvent swells the cellulose acetate fiber and the dye is retained in what you have described as akin to solution in the fiber, wouldn't that be true with respect to Exhibits 5-A and 5-B, also?

A. Well, no, I don't believe so.

Q. Can you tell us why it would not be, if the materials are the same?

A. Well, the materials are the same, but the treatment is quite different. That is, the treatment is different in the sense that the dye, in the case of Abel and Dreyfus, is on there in a larger amount, and it has not had a chance to orient itself or adjust itself, which it has in the case of the Switzer material.

Q. When does the solvating action take place?

A. Solvating with respect to the cloth?

Q. Yes, that is correct.

A. Well, it probably takes place partly during the soaking process and partly during the rinsing process.

Q. So if all the material is immersed in the dye bath, there is a swelling action of the fiber taking place in all the exhibits, isn't there?

A. Yes, part of it certainly takes place. There is certainly swelling.

Q. If there is solvating action of the fiber, isn't the dye in solution in the swollen fabric in all cases?

A. Well, as far as we can judge, it is not. It is up to you to judge. But as far as we can judge, it is not, because you don't get this effect which we find to be associated with good solution. In other words, you don't have a good solution until you rinse it off—until you rinse out the excess.

I think there is one very important point that you might—that is, if you would like me to make it, I could help to explain this quite a bit.

That is, that a dye such as rhodamine is highly tinctorial. It is also extremely delicate with respect to its environment or the material that it is associated with or surrounded by.

If you take pure rhodamine B—just 100 percent rhodamine B—it does not have this bright red orange shade at all. The molecules are too closely packed for them to retain the energy—that is, the energy of the absorbed light—and then give it off as fluorescent light.

Similarly, if you add certain substances, such as nitro compounds—nitrous compounds—or certain colorless organic derivatives, you can have a serious effect upon the fluorescence of the dye, because of the surrounding molecules affecting the dye molecules.

The curious thing is that rhodamine itself has a bad effect on its own molecules. In other words, if they are packed tightly, they interfere with one another and prevent proper fluorescence.

Apparently, then, the state that is best for fluorescence is one in which the individual dye molecules are not interfered with by other dye molecules. That is, they have to be of a certain concentration. If you get above 2 percent or so, you don't get fluorescence. Furthermore, they have to be associated with a solvent molecule of some kind, such as alcohol or cellulose acetate or some other synthetic resin, or some other organic material, which brings out this fluorescence.

Now, the main trouble with the Dreyfus and the Abel examples is that although the alcohol undoubtedly does swell cellulose acetate, the dye goes in there, and there is too much of it present. It furthermore has no chance to arrange itself and become solvated with the cellulose acetate. Therefore, you don't get fluorescence.

Q. In connection with your statement that there is too much dye going into Exhibits 5-A and 5-B, why should that be if they are all treated identically in the same bath, of the same material, and the same environment and the same conditions?

A. Well, simply because in the one case the dye was not rinsed and removed—that is, the excess was not removed. In other words, the thing was not finally conditioned.

Q. You are talking, now, about the subsequent treatment, after you take the materials out of the bath?

A. That is right.

Q. But while they are in the bath, they are all under the same conditions and in the same environment, and the same thing ought to happen, ought it not?

A. Yes, it must happen.

Q. The same thing must happen. So you will admit that insofar as solvating action of the dye bath solution on the cellulose acetate fiber is concerned, in all instances it is the same?

A. It is identical, yes.

Q. So there is swelling of the fiber in the exhibits which you have marked as "Dreyfus process" and "Abel process"?

A. Yes.

Q. During that solvating action, isn't the dye going into the fiber?

A. Yes, it goes into the fiber, unquestionably.

Q. When the fabric came out of the bath, was there any reason why that dye that was in the fiber should come out?

A. When the fabric was taken out?

Q. Yes. Doesn't that dye remain in the fiber?

A. In the cases where they were dried up, certainly.

Q. So you would have a fabric in which fluorescent dye is in solvated condition in the fiber?

A. Well, no, not necessarily.

Q. What changed the condition from a state of solvated condition while it was in the bath to the condition it was in after it came out of the bath?

A. Well, the washing has a great deal to do with it.

Q. I am speaking of Abel and Dreyfus, now.

A. Oh, the condition before they were in the bath and after they came out?

Q. I believe you admitted that while these exhibits were in the bath, there was solvating action occurring on the cellulose acetate fiber.

A. Well, the alcohol was swelling the cellulose acetate.

Q. That would be true in all instances, wouldn't it?

A. Yes.

Q. And in all instances, isn't it true that the dye was being carried into the interior of the solvated fiber?

A. Yes, but the dye itself did not attach in its characteristic manner—that is, the manner characteristic of high fluorescence.

Q. Let us look at the dye in the fabric as it is in the bath.

A. They are all identical.

Q. They are all in the same bath, and they are all under the same conditions. There is solvating action taking place in each one of them—each sample you put in there—isn't that true?

A. There is swelling action of the cloth and a penetration of the weave by the dye.

By the Court:

Q. But at that point it has got to be the same?

A. Yes.

Q. They are immersed for the same period of time?

A. That is right; it is the same for all of them.

By Mr. Schimmel:

Q. We have them all in the same condition, with dye in the swollen fiber.

When you took the first sample out—which was Dreyfus—after a short period of time and allowed it to dry, was that solvating condition changed?

A. No, not over—well, to some extent some of the dye comes to the surface—that was inside—probably.

Q. Isn't it true that there is some dye dispersed in the fiber because of the original swelling action of the fiber by the dye solution?

A. Oh, yes; I think we can say undoubtedly some of it is in proper condition.

Q. Would you say that would be true with respect to the sample you have marked according to Abel's process?

A. Yes, I would say so.

Q. If it is common practice—and I believe you conceded it was common practice in the art—after the materials come out of the dye bath and after they have been dried, to wash them or rinse them—

Mr. Ely: Excuse me. I do not know whether Mr. Ward did concede that.

By Mr. Schimmel:

Q. Well, is it common practice after the materials have been dried to rinse them and wash them?

A. Well, we really cannot state on that point, because this particular method is entirely different from ordinary dyeing. We do not know what common practice is.

Q. May I refer you to the Dreyfus patent, page 2, column 1, line 22. Would you mind reading that?

The Court: Let me get that.

A. "The fabric may then be rinsed or given any other suitable after treatment."

By Mr. SCHIMMEL:

Q. I gather, then, that you did not rinse the fabric which you have exhibited here as being made according to the Dreyfus patent; is that correct?
A. That is correct. Well, I don't know about the patent. I made this—It says, "It may be."

By the COURT:

Q. No. The question is, You did not rinse it?
A. I did not rinse it; that is correct.

Mr. SCHIMMEL: I believe that is all, Your Honor.

Mr. ELY: That is all. Thank you.

(The witness left the stand.)

Mr. ELY: I should like to introduce Exhibits 5-A, 5-B, and 5-C into evidence.
Mr. SCHIMMEL: No objection.
The COURT: Very well. They may be received.

(Plaintiffs' Exhibits 5-A, 5-B, and 5-C for identification were received in evidence.)

Thereupon, JOSEPH L. SWITZER, resumed the stand and, upon examination, testified further as follows:

DIRECT EXAMINATION (Resumed)

By Mr. ELY:

Q. I hand you, Mr. Switzer, a paper which I shall ask to have identified as Exhibit 6.

(The paper referred to was marked as Plaintiffs' Exhibit 6 for identification.)

By Mr. Ely:

Q. Will you tell the Court what that paper, Exhibit 6, is, please?

A. This is a historical data sheet which accompanied the new specification 7245 on signal panel set AP-50, August 10, 1942.

Q. That is an Army——

A. It is a Signal Corps specification on a new type panel involving the use of daylight fluorescent fabrics on this panel.

Mr. Ely: I should like to introduce this exhibit in evidence, if Your Honor please.

Mr. Schimmel: No objection.

The Court: It may be received.

(Plaintiffs' Exhibit 6 for identification was received in evidence.)

By Mr. Ely:

Q. As stated in Item 2, page 1, of the exhibit, what was the purpose of the new specification?

A. It says for immediate procurement of this new device.

The Court: I think the exhibit speaks for itself.

Mr. Ely: Yes.

By Mr. Ely:

Q. From whom did the Army propose to obtain that immediate procurement of daylight fluorescent signal panels?

A. They proposed to procure it from Continental Lithograph Corporation.

Q. Who was Continental Lithograph Corporation, or what was that company?

A. That was the first—that is a subsidiary of Warner Brothers, the first licensee under our processes and products.

Q. At the time procurement was being made, what was the capacity of Continental Lithograph Corporation to produce such daylight fluorescent fabrics?

A. Well, it was small. We had but one machine.

Q. Was it enough to meet the size of procurement?

A. No. At that time, no.

Q. Will you refer to Item 14, where you find a list of names? That is on page 2. What do those names signify, and why do they appear there?

A. They are the firms that were contacted by the Signal Corps officers, with the hope that they could procure this product from these various firms, in addition to the capacity that we had.

Q. Will you explain to the Court the names of the firms after Continental Lithograph Corporation? The next name is William Simpson.

The COURT: Where are we going from here?

Mr. SCHIMMEL: If Your Honor please, I think we can save a lot of time in this case. Undoubtedly this type of evidence is to show commercial success and utility. There has been no issue raised as to commercial success and utility. I would be willing to concede on the record that there has been commercial success and utility. That would save a lot of this unnecessary evidence.

Mr. Ely: This is to show more than that. This is to show the novelty of this material as understood by the Army.

The Court: How does it show novelty?

Mr. Ely: As I believe Mr. Switzer will testify——

The Court: If he is going to testify, let him testify. I would not want him to produce a paper saying that novelty is shown.

Mr. Ely: I think it will be brought out that novelty is shown, Your Honor.

The Court: All right, sir. Then, let him bring it out, if he can.

By Mr. Ely:

Q. Who is William Simpson Sons & Company, of New York?

A. They are a large textile broker.

Du Pont is a manufacturer of cellulose acetate and rhodamine dyestuffs.

Century Lighting, Incorporated, is a manufacturer of electric light equipment and fluorescent materials for stage use.

Celanese Celluloid Corporation is the originator of cellulose acetate fabrics and processes for dyeing, the president of which is Camille Dreyfus.

Q. That is the same Camille Dreyfus of the Dreyfus patent introduced in evidence?

A. Exactly.

Skinner Satin Company is the foremost quality producer of cellulose acetate satin in the country.

Continental Lithograph Corporation was the Switzer licensee to manufacture daylight fluorescent fabrics.

Q. Now, read Item 12. Will you read that, please? Read the question of Item 12 and the answer.

A. The question is:

"Is the item in commercial production and obtainable on the open market?"

The answer from these investigators is: "No."

Q. Read the next subquestion there.

A. Answer: "Known facilities for obtaining item." "Continental Lithograph Corporation."

The Court: Would it follow that because it is not available on the open market, there would be novelty?

Mr. Ely: Yes, sir; I would believe so.

By Mr. Ely:

Q. Do you know personally, Mr. Switzer, if those companies were interested in obtaining the business which would be involved in preparing these daylight fluorescent fabrics for the Army service??

Mr. Schimmel: I object to that.

The Court: I sustain the objection. He would not know that.

By Mr. Ely:

Q. Did any of those companies contact you in connection with obtaining business or making inquiries of the Army?

A. They did. The officers——

The COURT: I think you have answered the question.

Mr. ELY: Yes, sir; he has.

The WITNESS: They did.

By Mr. ELY:

Q. Did Celanese Celluloid Corporation contact you in connection with obtaining this business?

A. Yes, sir.

Q. Whom did you confer with in Celanese Celluloid Corporation with regard to production of these fabrics?

A. I conferred with Mr. Vervort and Mr. Camille Dreyfus.

Q. What did Mr. Camille Dreyfus tell you——

The COURT: I will sustain objection to that.

By Mr. ELY:

Q. Did you discuss the production of daylight fluorescent fabrics with Mr. Camille Dreyfus?

A. I did.

Q. In what connection?

A. I requested that they—Celanese Corporation—follow a process of incorporating the daylight fluorescent dyestuffs into the dope before the yarn was drawn or formed, so that we could be positively sure that we had the dyestuff solvated in and uniformly dispersed throughout the filament, hoping that by that method we could increase the amount of textile—daylight fluorescent textile—available to the armed forces when it was so urgently needed.

His engineers were present and considered that.

The Court: He can't tell what they considered, sir.
Mr. Ely: He can't tell what they said to him?
The Court: I have held that he cannot.

By Mr. Ely:

Q. Did the Celanese Corporation produce daylight fluorescent fabric for you according to that proposed alternative method?

A. No.

Q. What reason did they give you against producing daylight fluorescent fabric by your proposed process?

The Court: If there is objection, I will sustain the objection to that. If you want those men here to let them testify, that is all right; but this is purely hearsay, Mr. Ely.

By Mr. Ely:

Q. Were your daylight fluorescent fabrics confined to the air-to-ground recognition signal system which you described yesterday?

A. No. There were many other military uses.

Q. I hand you here a letter headed, "The Celanese Company, Incorporated." Will you identify that letter by date and tell the Court the purpose for which it was written and by whom?

A. The letter dated February 13, 1945, written by Mr. Vervort, of the Celanese Corporation——

Mr. Schimmel: I object to this.
The Court: I sustain the objection.
Mr. Ely: Sir, I have another purpose here to put this in.

The Court: You may state your purpose, but you are attempting to get in papers from which the Government would have no opportunity to examine or cross examine. You are attempting to do indirectly that which you cannot do directly.

Mr. Ely: I would like to get this in for nothing else than—or else I could have Mr. Switzer testify to what I want him to identify. This summarizes the various types of daylight fluorescence.

The Court: You do identify that paper as what, sir? A letter dated February 12 from whom to whom?

Mr. Ely: That is the point: To whom was this addressed, and why?

The Court: No, sir. What I am trying to do is permit it to be identified

Mr. Ely: I would like to identify it as Plaintiffs' Exhibit 7.

The Court: Have you seen it, Mr. Schimmel?

Mr. Schimmel: I have a copy here, yes, sir: "To whom it may concern."

By Mr. Ely:

Q. For what purpose was that letter written?

The Court: I will sustain objection to that. For the protection of your record, you may make a proffer of that letter.

Mr. Ely: I should like to, sir.

The Court: All right.

Mr. Ely: In further identifying the letter, may we have on the record to whom this letter was sent, for the purpose of using the letter at the time it was written?

The Court: You are asking what the purpose of it was?

Mr. Ely: May I have that in the record?

The Court: No. I think the letter speaks for itself. You have made a proffer. There is objection to it. I have sustained the objection. It will be a part of the record for consideration if the matter go further. In other words, I want to protect you on the record, Mr. Ely.

Mr. Ely: Thank you. May I ask the witness one question; namely, that insofar as the letter identifies the various uses to which——

The Court: I will sustain objection to that. You are now doing the same thing. We will let the letter speak for itself.

By Mr. Ely:

Q. I hand you here a letter, which we will identify as Exhibit 8.

(The letter referred to was marked as Plaintiffs' Exhibit 8 for identification.)

Mr. Schimmel: The same objection, if Your Honor please.

Mr. Ely: Please let me examine the witness with respect to it.

The Court: Maybe you had better let me read it, Mr. Ely.

Mr. Ely: Yes, sir (handing a paper to the Court).

The Court: You have asked him to identify a letter from Lieutenant W. B. Hughes, Supply Corps, U. S.

Navy, to Continental Lithograph Corporation, and that is marked as Plaintiffs' Exhibit 8 for identification, sir?

Mr. Ely: Yes.

The Court: What do you want him to do with that?

By Mr. Ely:

Q. Continental Lithograph Corporation was your licensee, as I understood you to testify, during the war?

A. That is right.

Q. Who was Mr. Nestell?

A. Mr. Nestell was the Washington representative for Continental Lithograph Corporation.

Mr. Ely: I should like to introduce this record into evidence, if you please.

The Court: I will deny the receipt of it, sir.

By Mr. Ely:

Q. I have here a magazine article which I would appreciate your identifying to the Court.

The Court: Do you want to have that marked as Plaintiffs' Exhibit 9 for identification?

Mr. Ely: Yes, sir.

(The magazine article referred to was marked as Plaintiffs' Exhibit 9 for identification.)

Mr. Schimmel: I have no objection.

The Court: If there is no objection, it may be received.

(Plaintiffs' Exhibit 9 for identification was received in evidence.)

By Mr. Ely:

Q. Will you identify that article for the Court, please?

A. this is an article written by John N. Johnston, of McGraw-Hill, Cleveland News, which was published in May, 1945, in The Textile World, a trade journal going to the textile industry.

Q. What does the cut or picture on the front side of the exhibit show?

A. It shows a daylight fluorescent signal panel in use on the tanks.

Q. It is the manner of using them?

A. It is the manner in which they were used.

Q. What does the cut or picture on the back of the article show?

A. That is a landing signal officer's uniform involving the use of daylight fluorescent materials which were used to bring in the plane safely.

Q. What does the chart in the center of the front page show?

A. It shows the relative brightness in footlamberts of a daylight fluorescent fabric as against a non-fluorescent international fire orange or international orange panel.

Q. I have another colored picture here in subtractive colors, which I would appreciate your identifying, please.

A. Well, that is the same landing signal officer photograph in color under black light, wearing the fluorescent suits and signal paddles.

Mr. Ely: I should like to introduce that in evidence.

(The picture referred to was marked as Plaintiffs' Exhibit 10 and received in evidence.)

By Mr. Ely:

Q. You have testified that Continental Lithograph Corporation was a licensee under the process here in suit. Did you have any other licensees during the war for producing——

The Court: Isn't this unnecessarily cumulative, in view of the fact that it has been conceded that it was commercially good and had utility value?

Mr. Ely: I believe, Your Honor, that we will show by the action of foreign governments, where novelty was a matter of consideration by them, the novelty of this process having been considered by them, while concededly it is not binding upon this Court, that it is more than mere evidence of commercial success. Mr. Switzer could testify to the number of uses. That would be enough to show commercial success, I think. But in this particular case it went further. Patentable novelty had to be considered by foreign governments, as well as by our own United States Government, which I think is evidence of novelty rather than just commercial success.

The Court: Are you asking if there were more licensees than Continental?

Mr. Ely: Yes.

The Witness: Yes, there were.

By Mr. Ely:

Q. Will you name them, please? I am speaking of during the war.

A. There were Guaranty Silk Dye Finishing Company, of St. Catherine's, Ontario, in Canada——

Q. How did it happen that you selected Guaranty

Silk Dye and Finishing Company, of St. Catherine's, Ontario.

Mr. Schimmel: I object.

The Court: I will sustain the objection to that. He may have known the president, or he may have liked the engineer.

Mr. Ely: I think——

The Court: Anyway, I will sustain the objection, sir.

By Mr. Ely:

Q. Did Continental Lithograph Corporation and Guaranty Silk Dye and Finishing Company pay you royalties for the use of the invention here in suit?

A. Yes.

Q. Were you allowed to keep those royalties, Mr. Switzer?

A. Part of them, after renegotiation, or after negotiation with the Quartermaster Corps. They reduced them and allowed about half of them.

Q. I hand you here a letter which is identified as Plaintiffs' Exhibit 11. Will you identify that letter for the Court, please?

(The letter referred to was marked as Plaintiffs' Exhibit 11 for identification.)

A. That is a letter from the Philadelphia Signal Corps Procurement District, to the attention of my brother and myself, from LaBrum, who was the contract renegotiation officer for the Quartermaster Corps.

Mr. Ely: I should like to introduce this into evidence.

Mr. Schimmel: I have no objection to that.

The Court: It will be received.

(Plaintiffs' Exhibit 11 for identification was received in evidence.)

By Mr. Ely:

Q. You will note that the last line of the letter says: "Both Lieutenant Kyle and myself sincerely appreciate the courtesy and cooperation extended to us by your counsel and yourselves."

Can you tell the Court what that cooperation consisted of that he is talking of in that letter?

A. Well, we agreed to a reduction of the royalties. Continental was obligated to pay a higher rate of royalty and were willing to do so, but the officers involved were willing to pay a royalty——

The Court: I do not think that is going to have too much probative value, as far as I am concerned, in determining this—that is, the negotiations between these respective parties. I happen to know Mr. LaBrum, a lawyer in Philadelphia.

How much longer do you expect to be?

Mr. Ely: I imagine, because we are not getting down to the point of going through the references and Mr. Switzer's testimony with respect to the references, that my direct examination will undoubtedly go on up until noon.

The Court: Then, we will recess at this point until twenty minutes of eleven.

(At this time a short recess was taken. The following then occurred:)

The **Court**: When you are ready, Mr. Ely, you may proceed.

Mr. **Ely**: Thank you sir. I do not wish to belabor this point, but I should like to identify, for introduction into evidence—and I know now there will be objection to it—a letter——

The **Court**: Suppose you take them all over to the clerk and let them be identified. Then we will hear from you.

Mr. **Ely**: All right.

(Two letters were marked as Plaintiffs' Exhibits 12 and 13, respectively, for identification.)

By Mr. **Ely**:

Q. Mr. Switzer, will you identify this letter that we have marked as Plaintiffs' Exhibit 12, please?

A. This is a letter from Guaranty Silk Dye and Finishing Company, of Canada, to Switzer Brothers, in Cleveland, written by the vice president of that company, Mr. Macartney.

Q. Will you identify Plaintiffs' Exhibit 13 for identification, please?

A. This is a letter—a copy of a letter—written by the British Army Staff to Guaranty Silk Dye and Finishing Company, to the attention of Mr. Mccartney, written by Major Macleod.

Mr. **Schimmel**: I will not object to Exhibit 12, Your Honor, but I will to Exhibit 13.

The **Court**: If there is no objection to Plaintiffs' Exhibit 12, it will be received.

(Plaintiffs' Exhibit 12 for identification was received in evidence.)

The COURT: You do object to Exhibit 13?

Mr. SCHIMMEL: To Exhibit 13.

The COURT: Let me read it, sir.

(After reading paper) I will sustain the objection to Plaintiffs' Exhibit 13.

Mr. ELY: I think we will let the letter speak for itself.

The COURT: Very well, sir.

By Mr. ELY:

Q. Mr. Switzer, I hand you a copy of the Abel patent, British Patent No. 1,939, of the year 1906, which has been identified and handed to the Court as "A" in the exhibit of the defendant. Are you familiar with that patent, Mr. Switzer?

A. Yes, I am familiar with it.

Q. When did you become familiar with it?

A. Well, when it was submitted as a reference by the Patent Examiner.

Q. Have you endeavored to dye cellulose acetate in the manner stated by the reference?

A. Yes.

Q. What results did you obtain in carrying out the examples of that patent?

A. Do you mean when I followed the examples per se?

Q. Yes, sir.

A. Well, with the exception of Example 3, we got the general results that were described.

When we attempted Example 3, the fabric was destroyed by following the procedure to the letter. In other words, it appears to be inoperative.

By the COURT:

Q. Did you say the fabric was destroyed?

A. It was destroyed.

By Mr. ELY:

Q. How was the fabric destroyed?

A. Well, when we immersed it into that strength of solution at that temperature, the cloth began to coalesce and completely fuse together; and that was enhanced tremendously when we subjected it to the 100-degree water as a rinse.

Q. Example 3 advises to rinse with warm water; isn't that correct?

A. Yes, warm water, which was not a hundred degrees Centigrade; that would be about 140-degree water—that is, Fahrenheit. But coalescence took place—primarily started to take place—and destroy the fabric in the bath itself.

We used half alcohol and half water at 70 degrees Centigrade. Well, that completely attacks the fabric. You don't have a fabric when it comes out of there. You have a plastic—a plastic mess.

Q. What does Abel state as the advantage of his process?

A. Well, the way I interpret his advantage or his purpose is to use dyestuffs that would normally not exhaust onto or have any natural affinity for acetate, primarily, I suppose, because there weren't any direct acetate dyes in those days; you had to use dyes that wouldn't exhaust on, as I explained to the Court yesterday. But he wanted to get—that is, they wouldn't exhaust any great color strength. They didn't have any tinctorial strength when exhausted on.

So he wanted to get very deep shades of these dyes that were adhered or fixed to the goods by some other process—that is, by some process other than exhaustion. So he made his dye baths very strong in dye and used solutions which would have a tendency to fuse or semi-fuse the fabric, and then the dye upon drying those solvents from that—that semi-fused or jelled fabric hardened again and maintained the dye in a mechanical state of fix on the goods.

But he was primarily interested in getting deep shades—deep shades—with the dye.

Q. He says in many places in the patent that you get deep shades, doesn't he?

A. That is right. That is what he is after, because he couldn't get them any other way, he says. He says:

> "For instance, from an aqueous solution of methylene-blue, artificial silk from acetylated cellulose cannot be dyed at all; moreover, from an alcoholic solution this coloring matter produces on this silk only very feeble tints, whereas from a dye-bath containing this dyestuff, water and ethyl alcohol deep blue tints are obtained."

So the purpose of his invention was to get deep shades with these dyes.

Q. Does Abel anywhere mention anything about fluorescence of his fabric?

A. No, he does not. He was after deep shades.

Q. In his example, does Abel use any fluorescent dyes?

A. No, not in the examples.

By the Court:

Q. In any of the examples?

A. That is right.

Q. That was plural, wasn't it?

A. That is right.

By Mr. Ely:

Q. Does Abel suggest alternatively that you might use a dye which might be fluorescent?

A. In the dyes listed, that might be used by his process, he includes the general type called rhodamines. Some of those dyes are definitely daylight fluorescent, and some of them as of that day would have been definitely daylight fluorescent in solution.

Q. Would every rhodamine dye—and that is a narrow term—necessarily be daylight fluorescent?

A. Oh, no.

Q. The Patent Office has suggested that you might experiment with the Abel patent and obtain a daylight fluorescent result.

Following so much of the procedure as Abel teaches, and assuming for the sake of questioning that you substituted a daylight fluorescent rhodamine, or a rhodamine capable of daylight fluorescence, as a dye, will you obtain a daylight fluorescent fabric by so experimenting?

A. No, I don't believe so. Mr. Ward did that in Example 5-A—or Exhibit 5-A. That material shows very little, if any, daylight fluorescence.

Q. Yet looking at Exhibit 5-A, what sort of shade would you classify that shade?

A. That is a very deep, full shade, just what Abel expected.

Q. Now, how do you account for the difference in shade and the different color effects on the fabrics when dyed by your process and by the Abel process?

A. Well, Abel carries out steps similar to ours, or we carry out steps similar to Abel's, assuming that we use the daylight fluorescent dyes up to the point—the all-important point—of cold flushing with water.

Now, in order to get a deep shade, that Abel wanted, he wanted to set that dye before he washed it. He wanted the goods softened in the maximum amount of dye in contact with the goods at that point; and then, to get the maximum amount of dye, he would dry the goods, removing the solvent, and hardening the goods. In that process he got an enormous amount of dye reasonably well fixed or permanently adhered to the outer surfaces of the fiber, very closely packed, and very deep in shade.

In producing the daylight fluorescent fabric, we know that we cannot—we now know that we cannot—have a concentration of the dye on the surface, for we must have the dye uniformly molecularly dispersed throughout the entire filament, not in high concentration on the surface and low concentration in the center. If it is going to exist in the state of distribution that would exist in solution, the concentration is uniform throughout the whole solution, and that is why when we flush with water before drying, the water removes the alcohol and leaves the dyestuff within in true proportion or in uniform concentration. It does not bring it out to the surface or concentrated on the surface. It gives us a result finally by that process of extraction, by flushing—it gives us a result which leaves the dye uniformly distributed throughout the fiber and not concentrated on the surface or near the surface.

Q. What happens to the dye inside or which has been driven into the filament, when you take the fabric out of the dye bath and allow it to dry?

A. It would be inclined to excresce to the surface and follow the solvent up, giving you a high concentration on the surface of the goods, which gives you a high strength color and compactness of dye molecules.

Q. In other words, assuming that it is in this state of swelling, of the swollen fibers, before you take the dyed fabrics out of the dye bath, it is then that you have the filament swollen with the dye liquor; is that correct?

A. Yes, it is. It takes on almost an equal volume of that dye bath—of that strong dye bath—equal to its own volume.

Q. What happens to the volume of the filament when you take it out of the dye bath and allow it to dry?

A. It collapses back to its original volume by removal of the strong absorbed solvent.

Q. In other words, when you dry during that drying process, there is nothing to replace the solvent?

A. No.

Q. And the alcohol?

A. No, there isn't. It just evaporates out and shrinks down.

Q. When you cold flush immediately after taking your fabric out of the dye bath, what happens to the filament?

A. Well, shrinkage occurs, but it is very much slower, because you are displacing the solvent—strong solvent—which causes the swelling. You are displacing that gradually with a non-swelling medium. The shrinkage finally comes to—as you flush more and more, it finally brings it down practically to normal size.

By the COURT:

Q. Do you mean the fabric?

A. The fabric.

By Mr. ELY:

Q. You mean the fabric filament?

A. That is right.

Q. Is it true that in distinguishing between your process and the Abel process or the Dreyfus process, which has been discussed here, in the Dreyfus process there is no replacement of the dye bath which evaporates from the fabric; is that correct?

A. That is right. In Dreyfus, specifically if they are deep shades again, with about similar dyestuffs to those used by the English process, the essential difference is that he endeavors to do it by the padding rather than by bath. He calls it a mechanical process rather than a bath process. But they are both after the maximum amount of dye they can put on.

He says that after drying—after immersing and padding—Dreyfus says that after immersing and padding from these strong solutions containing high percentages of dye, you dry, and the drying fixes a deep amount of color on the fabric, and it is surprising how fast that color is if you dry first. He brings that out.

Q. Dreyfus is also after a deep color? He mentions that in his specifications?

A. Yes; and these colors, he admits, have little or no natural affinity for the goods. But he said the surprising thing about this process of padding in the strong solution and then drying before you wash is that you get a deep amount of color, fast to washing; in other words, that it does not remove that high concentration of dye; that it is fused or plaited into the filament if you dry before you rinse.

Q. You stated that in your process during the flushing with cold water there was a dilution of the dye bath in and on the fabric; is that correct?

A. There was an extraction, or a slow or gradual replacement or extraction, of the solvent from the fabric.

Q. When you say, "solvent," which solvent do you mean?

A. The alcohol.

Q. Do you have in your process the excrescence of dye to the surface of the filament, as you said occurs in the Abel process?

A. No, you don't.

By the Court:

Q. You don't have what?

A. You don't have the excrescence or the flow back to the surface of the dye.

Q. That is, in the washing?

A. That is during the rinsing or the flushing. It is normal to rinse goods that way by dyeing with direct colors; but when you are trying to get a deep shade of color which is not direct to the goods, then you try to obtain or put a lot of that color on temporarily, and then fix it on in some way, because it has no natural affinity for the goods.

By Mr. ELY:

Q. Insofar as Dreyfus is concerned, will you read the sentence commencing on page 2, column 1, line 21? Excuse me. Start up at line 19.

A. All right.

> "To obtain maximum fastness to soaping and for most successful results, it is important that the ethyl lactate or other volatile organic liquid employed should be completely removed by the drying process."

Q. Now read the next sentence.

A.

> "The fabric may then be rinsed or given any other suitable after treatment."

Because, keep in mind, he wants deep shades, he wants the maximum amounts of dye, and he knows that dye is not fixed in there, and that by removing the solvent by drying it leaves an enormous amount of dye in and around the surface.

Q. Dreyfus does use a dye which could be daylight fluorescent; is that correct?

A. Yes, he does.

Q. By that I mean the dye itself is capable of daylight fluorescence?

A. That is right. He calls for——

Q. Page 2, column 1, line——

A. One of the examples of dyestuff that he says is operative according to his process is rhodamine 3 G. O., Color Index No. 749. I think his index number is a little different than his information, but it would indicate one of the rhodamines that would be daylight fluorescent when they were in the state of proper solution and uniform concentration.

Q. However, does Dreyfus mention anything about fluorescence and fluorescence of his fabric?

A. No, he does not.

Q. I call your attention to the French Rhodiaseta patent, or rather the translation of it, which has been introduced by the defendant as F in their exhibit, the patent being number 579,896. Now, as shown by the record the Patent Office appears to rely very heavily on the Rhodiaseta patent as an anticipation of your process and product. Are you familiar with the Rhodiaseta patent?

A. Yes, I am familiar with it. I have read the translation numerous times.

Q. Have you performed the example of the Rhodiaseta patent?

A. Yes, I did. I conducted it for an affidavit which was submitted to the Examiner.

Q. That was Example 8, was it not?

A. I believe so. That is one in which rhodamine B was mentioned specifically—rhodamine B and acetate silk.

Q. Example 8 says:

> "The dye obtained is a very fluorescent rose."

Was that fluorescence a daylight fluorescence, Mr. Switzer?

A. It does not say that it was at all.

Q. I am asking you, Was the example itself that you performed?

A. Oh. The result I got certainly was not daylight fluorescent, following the procedure as outlined.

Q. I hand you a swatch of fabric. Is that the type of fabric you obtained by following Example 8?

A. That is the exact result, yes. That fabric was processed in exact accordance with Example 8.

Q. Who did that processing?

A. Mr. Ward and myself.

Mr. Ely: I wish to introduce that into evidence as Plaintiffs' Exhibit 14.

Mr. Schimmel: No objection.

The Court: It may be received.

(The swatch referred to was marked as Plaintiffs' Exhibit 14 and received in evidence.)

By Mr. Ely:

Q. In your affidavit you mentioned that when you operated according to Example 8, you obtained tarry deposits of dye in your own dye bath container and on the fabric. Is that correct?

Mr. SCHIMMEL: May I ask for more specific identification? There are about four affidavits in this case.

Mr. ELY: That is the affidavit which was filed with amendment D, which I believe would be paper number 10. The affidavit was filed with amendment D as in David.

The COURT: Is that affidavit in the file which you gave me, sir?

Mr. ELY: Yes, sir.

The COURT: Can you give me an indication of where I can find it?

Mr. ELY: Yes, sir. It would be paper number 10.

Mr. SCHIMMEL: Page 87 of that record.

Mr. ELY: It would be page 88 of the Court's record.

By Mr. ELY:

Q. In the second paragraph, you state:

> "When the procedure as described in Example VIII was followed to the letter, a very poor result was obtained. The ½ gram of Rhodamine B and the 2-grams of sulfo salicylic acid were added to 3 liters of water. A good deal of the dye stuck to the sides of the beaker, even when the temperature was raised to 65 degrees, and a certain amount of it seemed to remain in this tarry, undissolved state all during the dyeing."

A. Yes.

Q. Referring to Exhibit 14, can you show the Court the evidence of where the tarry matters take place?

A. We reduced that appreciably by——

Q. We will get to that. This is according to Example 8, specifically, you stated?

A. Well, I believed that was right. It was done exactly in accordance with Example 8. That is right. This example here, Exhibit 14.

Let me see the other examples. I want to make sure of that.

Q. One of the other examples will be of record. The one you testified to or gave your affidavit to is——

A. Yes, that was dyed by putting both of the agents together, then immersing the cloth and bringing it up to 65 degrees Centigrade, and rinsing—that is, after cooking for half an hour.

By the COURT:

Q. You immersed, then you cooked it, and then you washed it?

A. That is right.

By Mr. ELY:

Q. Except in immersing it in your dye bath, was your dye bath the same as in your process or in the Abel process?

A. Oh, no, it is not at all similar. The Rhodiaseta patent calls for a small amount of special organic acids which have a tendency to bind that basic dye to form a more or less insoluble material. Those acids are also characterized by having an affinity for the cellulose acetate.

So the object was to put that acid on there which has affinity for the dye and also an affinity for the acetate, and then that would allow you to exhaust the dye, not because of its affinity for the acetate, but because of the affinity for the acid contained in the acetate—that is, the acid agent that they were using.

By the COURT:

Q. You are speaking now of Abel?

A. No; this is the French patent. This is well brought out right in the first of his patent. He states:

> "Certain basic dyestuffs, however, have very slight affinity, but it is insufficient to permit of real dyeing."

Now, he said that affinity is augmented by a preliminary treatment in a solution of alcohol or acetone—that is, a preliminary treatment, a treatment prior to the dyeing—and then dyeing, or——

By Mr. ELY:

Q. He is referring to the prior art there?

A. He is referring to the prior art there. (Continuing) or, in his goods, that he has found that the acids—benzoic, salicylic, paroxy-benzoic, and a number of other organic acids—can be applied either to the cloth first or during the dyeing, and they have a natural, or some natural tendency to stay in the goods and give the goods an affinity. They themselves have the affinity for basic dyeing, so they would have the ability to exhaust the basic dye, which would not normally exhaust on the goods alone. But, as in all exhaustion processes, you get a big percentage of the dye when it exhausts on there in high concentrations in and around the extraneous part or surfaces of the fibers.

Q. In your affidavit you described light tests that you performed. Point out the relative fluorescence—and that was black-light fluorescence—of the French method of dyeing and your method of dyeing.

A. Yes. These are photometric measurements of the two samples under black light, also under visible mercury light.

Q. Did these numerical measurements correspond with what you can see by visual inspection from this black light here?

A. Yes, they are actual numerical evaluations, but it is quite obvious to the eye that you have the same ratio as numerical.

Mr. Ely: I would like to show the Court the relative fluorescence under black light here.

The Witness: It does have some fluorescence under black light.

By Mr. Ely:

Q. I am now referring to page 10 of the Examiner's statement, in the record.

The Court: Is that in the affidavit?

Mr. Ely: That is L.

By Mr. Ely:

Q. In the next to the last paragraph, the Examiner states or comments on your affidavit as follows:

> "The affidavit states that in trying the French process it was difficult to avoid the formation of tarry precipitates. This difficulty could have been avoided by noting lines 37-44 of page 2 of the French patent."

Mr. ELY: I do not know about the translation.

The COURT: How does the paragraph start?

Mr. SCHIMMEL: It is page 3 of the translation.

Mr. ELY: Our translation is different from theirs.

> "It will be an advantage in certain cases to introduce activating substances."

Mr. SCHIMMEL: Page 3 of the translation.

The COURT: Are the translations identical?

Mr. SCHIMMEL: They are substantially the same.

The COURT: If I am reading the right one, they are not, sir.

Mr. SCHIMMEL: Do you have the right French patent, Your Honor?

Mr. ELY: It is French patent number 579,896.

The COURT: Which one is that number?

Mr. SCHIMMEL: It is F, page 3 of the translation.

By Mr. ELY:

Q. In other words, Mr. Switzer, you had noted that you got precipitation of the dye by following just Example 8?

A. Yes.

Q. Now, did you as a fact try that alternative procedure of introducing an activating substance little by little into the bath?

A. Certainly, I did. It is recorded in the affidavit.

Q. In other words, the Examiner's criticism of your affidavit is not justified, is it?

A. No sample submittted with the affidavit was done that way, because the other sample was so spotted and absolutely inoperative that I did not even suggest send-ing it in. The sample that was submitted with the affidavit was done precisely in accordance with that suggestion.

Q. Since the record as sent up by the Patent Office did not include the physical exhibits that were filed in the Patent Office, can you recognize and identify that sample?

A. That is the sample (indicating).

Q. This is a piece of material which was submitted to the Patent Office——

A. May 8, 1945.

Q. (Continuing) and was, as I understand, performed——

The Court: Hadn't you better mark this?

(The sample referred to was marked as Plaintiffs' Exhibit 15 for identification.)

The Court: I understand that this is the result of your following literally this French patent, F in the defendant's exhibit?

Mr. Ely: No, sir.

The Witness: That is using the alternative method.

Mr. Ely: Exhibit 14 is the one obtained by following literally.

This exhibit, number 15, is the exhibit which was produced by following an alternative example—that is, an alternative or modification of Example 8—and for which the Examiner criticized Mr. Switzer for not doing, but which was actually one that was submitted to the Patent Office.

By Mr. Ely:

Q. That is correct, Mr. Switzer?

A. That is correct. You see, I got this precipitation——

By The Court:

Q. Let me interrupt you to see if I can get this straight. Let me find out about number 14, now. That is the one which was received, and that was literally in accord with the French patent?

A. That one we have done just recently.

Mr. Schimmel: Sample 8 is the French patent.

The Court: Sample 8.

By The Court:

Q. Now, you made another experiment or performed another operation, or whatever you call it?

A. Yes.

Q. On the alternative provision of this French patent, and you came out with Exhibit 15?

A. That is right.

By Mr. Ely:

Q. Actually, it was Exhibit 15, was it not, upon which you performed the comparative test for fluorescence as represented in your affidavit?

A. That is right; that was the exhibit, Exhibit 15 was the one submitted with the affidavit to the Office.

Mr. Schimmel: No objection.

The Court: Do you desire to offer Exhibit 15?

Mr. Ely: Yes.

The Court: It will be received.

(Plaintiffs' Exhibit 15 for identification was received in evidence.)

The Court: If you are at a convenient stopping point, we will recess.

Mr. Ely: I think I have just one more little thing.

The Court: Yes, sir.

By Mr. Ely:

Q. The examiner further criticised your affidavit regarding the French patent by including the following paragraph on page 10, as follows:

> "The samples attached to the affidavit show that the French product was much paler and did not have the fluorescence of applicants' product. This was to be expected as the French patent is described as rose-colored and the percentage of dye in the dye bath of the French patent is .017% as compared to applicants' .15%."

Meaning the dye in the dye bath.

I hand you another swatch of fabric. Will you identify that, please?

A. This is a fabric dyed in accordance with the French process, using the same amount of dyestuff that we used in our process, which the Examiner thought might account for the difference in result.

Q. In other words, the Examiner criticised, as pointed out on page 10, that when you followed the French patent, you use only the amount of dyes called for by the French patent?

A. That is right.

Q. Then he goes on to say that the lack of fluorescence in the French process was to be accounted for by using only that much dye, whereas you say you don't need the amount of dye used in that process?

A. That is right.

Mr. SCHIMMEL: Is this in accordance with the process in 14 or 15?

By Mr. ELY:

Q. Does that follow Example 8 precisely or Example 8 modified?

A. Example 8 precisely.

Mr. ELY: I wish to identify this as Exhibit 16.

The WITNESS: Example 8 precisely with the exception of dyestuffs.

Mr. SCHIMMEL: No objection.

The COURT: It will be received.

(The swatch referred to was marked as Plaintiffs' Exhibit 16 and received in evidence.)

By Mr. ELY:

Q. Example 8 has many dark spots on it. Can you tell what those dark spots are?

The COURT: Are you talking about Exhibit 16?

Mr. ELY: I am sorry. Exhibit 16; yes, sir.

The WITNESS: Well, they seem to be dyestuff that is coagulated with the organic acid to some extent—solubilized with a combination of the acid and the dye.

By The COURT:

Q. In all these there is some fluorescence, but minor as compared to yours?

A. There is some fluorescence. You can detect it under black light. But they are not obvious at all in daylight.

By Mr. Ely:

Q. The Examiner further criticised your affidavit, going to the top of page 11, as follows:

> "Another defect in the affidavit is that while the French process uses a 65° Centigrade dye bath the affidavit does not say whether the bath is 65° Centigrade or Fahrenheit."

Actually, in performing the experiment to produce Exhibit 15, which was submitted to the Patent Office, did you — 65 degrees Centigrade or Fahrenheit?

A. Centigrade.

Q. Why?

A. Well, because the French use the metric system, and generally they always mean Centigrade when they report temperature.

Q. I hand you here still another swatch of fabric. Will you identify that swatch, please?

A. This is a swatch of cellulose acetate dyed in accordance with Example 8 of the French patent, using the proper amounts of dyestuff called for and the proper amount of organic acid called for, but dyeing at 65 degrees Fahrenheit for a half hour.

Mr. Ely: I wish to introduce this in evidence as Exhibit 17.

Mr. Schimmel: No objection.

The Court: It will be received.

(The swatch referred to was marked as Plaintiffs' Exhibit 17 and received in evidence.)

The COURT: We will come back at 1:45, gentlemen.

(At 12:30 p.m. a recess was taken until 1:45 p.m. of the same day.)

AFTERNOON SESSION

Thereupon, JOSEPH L. SWITZER, having been previously duly sworn, resumed the stand and, upon examination, testified further as follows:

DIRECT EXAMINATION (Resumed).

By Mr. ELY:

Q. Mr. Switzer, I call your attention to British patent 412,952, offered by the defendant, constituting Item B of their exhibit. Are you familiar with that patent?

A. Yes.

Q. To what does it relate?

A. It relates to the dyeing of acetate in film, sheet, or paper form.

Q. To those skilled in the art, do the problems of film dyeing correspond to the problems encountered in dyeing woven fabrics?

A. No, I would not say so.

Q. What does the reference say about that parallel situation or that situation as to the parallelness of the color index?

A. This invention relates to the coloring of cellulose derivatives, and particularly to the coloring of cellulose acetate in film, sheet, or paper form.

The Court: Where are you reading?

Mr. Ely: Starting with paragraph 2, and the third paragraph.

The Court: Oh, and the third?

Mr. Ely: Yes.

The Court: Let me read it.

By Mr. Ely:

Q. Can you summarize that rather than read it?

A. It says that this method was designed to dye films, because the research of dyeing has been directed toward printing material in fiber or filament form—other processes of dyeing—and they are not applicable necessarily to the dyeing of cellulose acetate film. They are different problems entirely.

Q. Does the example of this British patent employ a daylight fluorescent dyestuff?

The Court: Is there only one example?

Mr. Ely: Yes, sir.

The Witness: The actual example does not.

By The Court:

Q. Does not use fluorescent dye?

A. No.

By Mr. Ely:

Q. In the technique of the British patent number 412,952, which we will call the Imperial patent, it being the Imperial Chemical Industries of England, do they show the step of washing immediately after contact with the dye bath or dye solution?

A. No; they apparently dry the color on.

Q. What effect would that produce on the film, Mr. Switzer, assuming, as suggested by the Patent Office, you might modify by substituting a daylight fluorescent dye?

A. It would tend to highly concentrate the color on the surface of the film.

Q. The same as in the other fabric?

A. Yes.

Q. I show you U. S. patent number 2,089,413, pled in the answer of the defendant, constituting H in the references in the defendant's exhibit. Does that patent relate to fluorescent dyeing?

A. Yes, it does.

Q. What kind of fluorescence? Black light or daylight fluorescence?

A. It relates to fluorescent dyeings that are responsive to black light only. They do not respond to any other wave length than black light.

Q. Reading Example 1, the last sentence of the paragraph—that is on page 1, column 2, line 6—what does it say about the dyeing?

A. "It then shows a fine pale bluish fluorescence when illuminated by ultra-violet light, but in daylight it has the appearance of undyed bleached cotton."

Q. In the course of discussion of the Abel patent, you also discuss the Dreyfus patent pled by the defendant and said to be similar to Abel's. In addition to the drying step as pointed out or as emphasized by Dreyfus in all his claims and in the specifications, how long does Dreyfus immerse the fabric in the dye solution which he said is padded on the roll or padded on the fabric?

A. Well, that could be best answered by stating that most padders—the machinery that is used in padding dips down into the bath and is immediately withdrawn and put through squeeze rolls. In other words, it would be a very short time of immersion in the actual bath.

Q. Dreyfus does not say how long he immerses them; he just simply assumes by skill in the art that you would follow the normal padding technique?

A. I don't believe he says how long; he just says immersed and then immediately padded.

Q. During that short period of immersion, do you have much opportunity for swelling of the fabric, as you obtain in your process or as might be obtained in Abel's process?

A. I don't believe you would. If you swelled it very much, the padder—the pressure of the padder—would destroy it. So I don't think you could have very much swelling at that point.

Q. The Patent Office also has cited the color index —page 190 of the color index. Are you familiar with that publication?

A. Yes, I am.

Q. What is it?

A. It is a publication produced by the Society of Dyers and Colourists of Great Britain. It has a general description of a tremendous number of different dyestuffs. They list the commercial names, the structural formulas when they are available, the preparation of the dye and who discovered it and what literature is available on it, and descriptions of the properties of the dyes in respect to dyeing, their colors, and so forth.

Q. In the particular dyes for which Mr. Schimmel is apparently citing this reference, it does mention, for example, with respect to Rhodamine B—you carry over to the opposite page—that it is a bluish-red solution with strong fluorescence when dilute.

Now, what kind of fluorescence is that reference speaking of in describing that characteristic of the dye? Is it daylight fluorescence or black light fluorescence?

A. I believe it is black light fluorescence.

By the Court:

Q. I did not hear you.

A. I believe it is black light fluorescence.

By Mr. Ely:

Q. When you put Rhodamine B in an aqueous solution, what color does it have?

A. It has a bluish-red or magenta color.

Q. That is, in white light?

A. It is in water.

Q. Does that water solution have daylight fluorescence?

A. You mean when dilute or when concentrated?

Q. Well, in either case.

A. In either case? It has very little, if any.

By the Court:

Q. Do you mean by that that it would have some daylight fluorescence in water or when applied to the fabric?

A. Oh, no; we were just talking about its fluorescence in solution, sir, in the water itself.

Q. But you had two properties: You had it in water, and then something else.

A. In dilute solution or in concentrated solution. It does not fluoresce in daylight appreciably in water. The fluorescence in water can be detected quite readily in strong ultraviolet or black light.

In alcohol solution, however, it does have strong fluorescence, not only in black light, but is very noticeable in daylight.

By Mr. Ely:

Q. When they speak of the strong fluorescence as to the water solution of Rhodamine B, what kind of fluorescence are they speaking of? Are they speaking of daylight fluorescence or of black light fluorescence? You said in daylight it had——

A. It would be strong and noticeable only under black light.

By the Court:

Q. But if they used alcohol, it would be strong in either black light or daylight?

A. Yes, if it is dilute.

By Mr. Ely:

Q. Why the difference between water solution and alcohol solution?

A. Well, the water, as I pointed out earlier—the solvent does play an important part in the fluorescence —the substrata, so to speak, or the solvent. That is, the dyestuff does not seem to be very powerfully fluorescent in daylight and in water, but it is very powerfully daylight fluorescent in alcohol in the same concentrations, both in dilute.

Q. What is the classification of water and of alcohol? How do you distinguish between them?

A. Water is different from alcohol in that alcohol is considered an organic solvent.

Q. Is water an organic solvent?

A. No, it is not considered an organic solvent.

Q. Referring to Dye 752, which they classify as Rhodamine 6G, in the last column, it says:

> "Dyes—silk, and cotton mordanted with tannin and tartar emetic, brilliant red to pink, yellower than Rhodamine G (No. 750), and acetyl-silk pink with a marked yellow fluorescence."

Does that reference tell you in any way how the acetyl cellulose would be dyed?

A. Well, in the first place, it doesn't tell you it is acetyl cellulose, but says, "acetyl-silk." Silk, unless it is artificial silk, is not cellulose.

Q. I see. As to that fluorescence, what would you presume the fluorescence is? Would that fluorescence they speak of be black light or daylight fluorescence?

A. Generally speaking, I would say that it is black light fluorescence, without a doubt, because throughout the entire color index they report time and time again the various fluorescent properties of certain dyes, and in many, many instances that fluorescence could not be detected except under black light. But they just simply speak of it as being fluorescent.

Wood's light examination of dyestuffs was a very common thing in early stages. There is also no relative table as to the fluorescent intensity or the efficiency. If you have a material that is very poorly fluorescent, and have very strong ultra-violet light, it can seem to be strongly fluorescent. But in comparison with efficient fluorescent materials, it is hardly to be rated fluorescent at all—detectable certainly only under very strong ultra-violet light.

Q. I have here a vial. Will you tell me what that vial contains, please?

A. That contains aqueous alcohol—70 percent, I believe, alcohol—and a very small amount of Rhodamine B dyestuff.

Mr. Ely: I should like to introduce this in evidence as Plaintiffs' Exhibit 18.

Mr. Schimmel: No objection.

The Court: It will be received.

(The vial and contents thereof were received in evidence as Plaintiffs' Exhibit 18.)

By Mr. Ely:

Q. I hand you here a piece of ordinary white paper with a stain on the corner of it. Will you identify that and explain to the Court what it is?

A. That is a paper—just ordinary paper—upon which some of this solution has been poured and the solvent dried up—evaporated off—leaving just the dye on the paper.

Q. Mr. Switzer, as a matter of physics, what do you know about the distribution of the dye molecules in the alcoholic solution which is Plaintiffs' Exhibit 18?

A. Well, they are in a state of molecular distribution, and they are uniformly distributed throughout the entire body of solvent.

Mr. ELY: I wish to introduce this paper as Plaintiffs' Exhibit 19.

Mr. SCHIMMEL: No objection.

The COURT: It will be received.

(The paper referred to was marked as Plaintiffs' Exhibit 19 and received in evidence.)

By Mr. ELY:

Q. What is the arrangement of dye molecules on the paper which is Plaintiffs' Exhibit 19?

A. The dye molecules may very well in that case be molecularly dispersed, but they are highly concentrated on the surface of the fiber, rather than uniformly and evenly distributed through it.

Q. They are not in a state akin to solution?

A. No, for two good reasons: One is that they are either concentrated on the surface or the substrata, and they are on pure cellulose, which is not a solvating organic material for that dyestuff.

Q. Approximately how many yards of your daylight fluorescent fabric were used by the military during the war?

A. About eleven million yards.

Q. Is it correct that there was urgent military demand for that material?

A. No question about that.

Q. You also stated this morning that Continental Lithograph Company was your first U. S. licensee under the process here at issue?

A. Yes.

Q. Have there been any subsequent licensees? Are there companies taking licenses to use your process on fabrics?

A. Yes.

Q. Will you name some of them, please?

A. Well, first, Guaranty Silk Dye and Finishing; next is Atlantic Rayon, of Providence, Rhode Island; next is Aberfoyle, Incorporated.

Q. As to Atlantic and Aberfoyle, are they large or small corporations?

A. They are very large, substantial corporations, expert dyers and yarn producers. Aberfoyle is one of the largest yarn producers in the United States, if not the world.

Q. Does Aberfoyle operate only in the United States?

A. They are worldwide. They have plants in Australia and Canada and affiliations with Fine Cotton Spinners, of England, and close association with Cortulds.

Q. Will you name some of the other licensees, if you please, sir—present licensees—for dyeing, just for the process of dyeing?

A. Virginia Dye Works; Liberty Dye Works, in Reading, Pennsylvania; the Jeffries Dye Works, of Philadelphia; Masurel Brothers, of France.

Q. The proper title of the company is Establishmente Masurel et Freres, S. A.

A. They are located in Lille, France.

Q. What is the size of that company and their experience in dyeing?

A. They produce over five million kilos of yarn per year for France and the Continent—3,500 different varieties—and they dye and process all of that yarn.

Q. Does Masurel pay you royalties on the basis of production of yarn according to your process?

A. Yes, he does. However, I will say that we do not have patents applied for in France.

Q. Mr. Masurel knows that?

A. He knows that.

Q. In that case, then, what was the consideration for paying royalty for that process in France?

A. He wanted to have the know-how—was willing to pay for the know-how.

Q. What is the present peacetime production of your daylight fluorescent fabric by your company and your licensees?

The Court: Is this peacetime?

Mr. Ely: I believe there is an Executive Order that says so.

The Witness: Present production?

By Mr. **Ely**:

Q. Let me put that as production for civilian use.

A. Present production for civilian use is approximately a hundred thousand pounds of yarn by Atlantic and Aberfoyle per month, and roughly a hundred thousand yards of piece goods by Richmond Dye Works, through Hausman and Sons. There is well over another hundred thousand yards per month being produced by ourselves and such firms as Vogue Textiles, of Pawtucket.

Q. Have your colors always been well received when introduced to the public? In other words, I am speaking particularly of the reaction in the British press in some respects to your colors.

Mr. **Schimmel**: I object to that.

The **Court**: What the press says?

Mr. **Ely**: Yes, sir. I have the press clippings here.

By Mr. **Ely**:

Q. Will you mention them briefly to the Court? Will you identify them?

The **Court**: When we get to the press, we have all sorts of things. You may have paid advertising—direct advertising. What is your purpose in showing this? Commerciability or utility?

Mr. **Ely**: No, sir; just the striking effect of it.

The **Court**: I will sustain the objection. I think it would be cumulative anyway.

Mr. **Ely**: I would like to identify them.

The Court: All right. Do you want them marked?

Mr. Ely: Yes, sir.

(Certain press clippings were marked as Plaintiffs' Exhibit 20 for identification.)

The Court: You are offering them; I will deny them.

Mr. Ely: That is all.

Cross Examination

By Mr. Schimmel:

Q. Mr. Switzer, in describing your process and the product produced by your process, I believe you said that the fabric contains the dye in a different state of molecular distribution than do fabrics dyed by ordinary processes, is that a correct summary of your statement?

A. I believe that is one difference.

Q. Would that be true of every fabric—organic fabric?

A. Using our process, you mean?

Q. Using your process.

A. Any organic process?

Q. That is right. That is the question.

A. No.

Q. May I call to your attention and to the Court's attention the claim for which a patent is sought, Claim No. 11, in which you are asking a patent for dyeing fabric comprising fabric of organic filaments? All organic filaments would not respond to your process, then, as I understood the answer to the last question?

A. All organic fabrics or filaments would not, no.

Q. Is it a fact that primarily the type of fabric or filament you are using is cellulose acetate fabric?

A. That is the preferred material, yes.

Q. Would your result be achieved or produced by the use of cotton fabric?

A. Not as effectively.

Q. What do you mean by, "not as effectively," if I may ask? Would it be a daylight fluorescent fabric in the sense that you are using daylight fluorescence?

A. I don't believe so.

By the COURT:

Q. In other words, if it were applied to cotton instead of acetate, you would not get the same result?

A. No; you would get a much lower order result.

By Mr. SCHIMMEL:

Q. In connection with your answer to that question, when you were comparing the color charts of the Ciba exhibit that was offered in evidence, what was the fabric on which those dyes were placed in the Ciba chart?

A. That was cotton.

Q. You were comparing cotton with respect to cellulose acetate, weren't you, in the case of Ciba?

The COURT: Is that the color chart you were referring to?

Mr. SCHIMMEL: That was offered as Plaintiffs' Exhibit 3, which we objected to at the time, but which he testified to.

The WITNESS: But the dyestuff was not put on in accordance with our method.

By Mr. Schimmel:

Q. No, I am not asking you that. That was the fabric?

A. That was on cotton—rhodamine mordanted onto cotton.

Q. In your testimony, in comparing the usual or prior art process with your process, you characterize, I believe, the prior art process as an exhaustion process; is that correct?

A. Everything except Abel and Dreyfus.

Q. You were not characterizing this process?

A. No, that is not an exhaustion process—those two.

Q. I was not clear on that. I did not get that clear. In connection with what you characterized as an important part of your process, the flushing step, when is that operation performed on the dyed fabric?

A. That is performed as the final step after the fabric has been soaked in the strong dye solution.

Q. Must that be performed immediately after dyeing, after the fabric comes out of the dye bath?

A. It is while it is still wet with the solution.

Q. Could you dry fabric in air, and would it not still be wet?

A. Dry it in air, and it would be wet?

Q. Couldn't you dry the fabric, as it comes out of the bath, in air for a while, and it would still be wet before it is fully dry—it is damp, for example?

A. It all depends on how you define "dry."

Q. Suppose you take a fabric out of the bath and suspend it in air for a while, and it is still damp—it does not dry immediately.

A. Damp with solvent or damp with water?

Q. With the liquid of the bath—damp with the liquid of the bath.

A. It does not flash dry; it would have to dry slowly in mid air.

Q. Then, wouldn't it be damp?

A. At what stage? How long?

Q. Say five minutes after you took it out of the bath.

A. With half alcohol and half water?

Q. I am asking you. About five minutes with half and half.

A. Half alcohol and half water, at room temperature, it would be perfectly dry—that is, if it was suspended in a single web with any air playing on it at all.

Q. Let us say you are just bringing it out of the bath.

A. Just right out of the bath, holding it in the air for five minutes, would it dry in that time? At room temperature, I think it would be pretty dry. It would probably have 10 percent moisture in it.

Q. Would you call that damp?

A. That would still be damp, yes.

Q. You would call it damp, wouldn't you, if it has about 10 percent moisture or liquid in it? You would call it damp, wouldn't you, instead of dry?

A. Yes, I would say it would still be damp with 10 percent, although cloth retains 6 percent of regular humidity—even dry cloth.

Q. I understand that, all right, but I want to get whether you would call 10 percent liquid in there damp or dry.

A. Well, those are very loose terms.

Q. I grant you that. You are an expert in the field.

A. I can give you—You don't specify the humidity of the room, the temperature of the room, or the length of time.

Q. Let me drop the time to, say, two minutes, then.

A. Two minutes? It is likely to be still damp.

Q. What you would call damp?

A. Yes.

Q. If you flushed the fabric at that particular time, after it had been drying in the room atmosphere for two minutes, would you still get your result?

A. It depends on whether the alcohol is all evaporated. The alcohol has an inclination to evaporate out faster, and you are liable to get a great deal of additional surface dyeing if that alcohol has evaporated, even though it is moist with a little bit of water.

Q. The question was, To get your result, you would have to flush with cool water immediately after it was drawn out of the bath?

A. That is what I say.

Q. Will you look at your claims and find, if you can, where you say you do that?

Take, for example, Claim 4. Can you find the word "immediately" in that claim?

A. No, but the claim is defined in terms of the specification.

Q. Let us not interpret the claim. That is not your function, if I may interrupt you.

Is the word "immediately" in that claim?

A. What do you mean by "immediately"? Instantaneously?

Q. You are the one who said that to get your result you had to flush it immediately. You answered the question, "Yes," when I asked it.

A. The word "immediate" is not in the claim.

Q. That is all I want to know. So, in other words, it is a conclusion that could be drawn that flushing in cold water without immediate flushing would not get the result you are after?

A. If you are in a dye plant and are dyeing fabric, it is dyed in a jig on a roll. That roll is dyed up through the jig and wet and soaked with the solution, and then the machine is reversed with an overflow rinse.

I mean when you say—when you just state—"in accordance with the art," that you dip, and then you rinse, that is certainly understood to mean that it goes and follows the normal sequence without any intermediate special step. If you had to dry, you would have to take it off the machine.

Q. You would say that that is the usual procedure in the dyeing art: to rinse after you dye, after coming out of the dye bath?

A. When it is specified.

Q. Just to clear the record, I show you Plaintiffs' Exhibit 6 and ask you if you can show us in that exhibit where the words "daylight fluorescent" or "daylight fluorescent fabric" appear?

A. They appear in the accompanying specification, 7245, panel set A.P. 50.

Q. But they do not appear in this exhibit itself?

A. Only in the specification referring to it.

Q. In discussing the Abel patent, I believe you said every example in that patent, except Example 3, gave the result that the patentee stated he got; is that correct?

A. Every one that I tried, yes.

Q. You tried all the examples?

A. All the examples we could get dyestuff for.

Q. Did you try an example with Rhodamine B?

A. There is no example in Rhodamine B.

Q. Did you try to use Rhodamine B as the dyestuff in any of the specific examples of the patent?

A. Yes. You mean substituting the dyestuff with—instead of the dyestuff required, Rhodamine B was substituted?

Q. Yes. That is the sense of the question.

A. Yes, we did that.

Q. In drying those, do you remember what proportions of water and alcohol you used in those baths?

A. I think it is in one of my affidavits.

Q. I do not think there is anything in your affidavit that relates to that particular bath.

A. Mr. Ward tried it with one percent of the weight of the dye bath solution.

Q. Is it your recollection that the amount of alcohol and water you used in drying that particular disclosure was that suggested by the patentee?

A. I believe it was, but there is a confusion in the patent, because he specifies his percentages, as I recall, on the basis of the amount of goods. Am I correct in that?

Q. No. He specifies in his example—if you will look at it, maybe it will refresh your memory—that he uses in his example—the first example—200 parts of water and 150 parts of alcohol.

A. Yes.

Q. In the other examples, the same designation is made: 500 parts of water and 500 parts of glacial acetic acid.

A. That is between one-half and one percent of the weight of the solution.

Q. You are speaking now of the amount of dyestuff in the solution?

A. Yes.

Q. I was speaking more of the organic solution in the dye bath, rather than the amount of dye.

A. We have tried it with his exact percentage.

Q. You also tried it with his exact percentages of dyestuffs, and the proportion of the dyes used in those examples was what, in your estimation?

A. In relation to the dye bath?

Q. In relation to the dye bath.

A. I think it was between one-half—we tried them at one-half and at one to one and one-half.

Q. Do you recollect how much dyestuff you can use in your particular process with relation to the dye bath?

A. We generally limit it to a maximum of 2 percent.

Q. In other words, the amount of dyestuff used by Abel is essentially the same as the amount of dyestuff you use in your baths, as far as your patent specification is concerned?

A. We don't deny that. It can be included in his—that is, his requirements include similar proportions.

Q. His proportions are less than 2 percent?

A. Some of his examples certainly are.

Q. In trying Abel's process, did you rinse the fabric after it came out of the dye bath?

A. We dried it before rinsing it.

Q. What was the usual procedure in dyeing cellulose acetate fabrics, when the patentee says he dyed in the usual manner? Wouldn't that incorporate the rinsing operation?

A. When he dyed with——

Q. The patentee states that he carried out the dyeing process in the usual manner. Wouldn't that, in your opinion, include a rinsing operation after the fabric came out of the bath?

A. No, not if he is having trouble getting color on. He would want to fix the color first.

Q. What gives you the idea that the patentee had trouble getting color on?

A. Because he says initially that he has difficulty getting strength by ordinary processes.

Q. Would you mind reading that and showing me where it is?

A. "It is a well-known fact that acetylated cellulose or artificial silk made therefrom, has not been applicable for many kinds of manufacture because hitherto it could not be dyed."

Q. The patentee says he dyes acetylated cellulose, doesn't he?

A. Yes.

Q. You don't deny that he dyed cellulose acetate fabric, do you?

A. I don't deny that he dyed or got color on it.

Q. In the usual process of dyeing materials, even as of that day, wasn't it customary to rinse the fabric after it came out of the dye bath?

Mr. Ely: I do not wish to object to this line, but it seems to me this is all speculative; and as a rule of law that affects this Court, an American inventor is not supposed to have to speculate.

The Court: This witness has held himself up as an expert, qualified to interpret these patents.

I think counsel is entitled to cross examine.

Mr. Schimmel: Also the witness, I might say, has testified to things that he has done. We do not have any evidence of what was done. We are just taking his word for it. He testified to it.

The Court: I will permit the question.

The Witness: Well, I will answer that question. If you have a dyestuff that is direct to the fiber, it does not matter whether you wash after you exhaust it on the fiber or not, because it is permanently fixed.

But if you have a color which has very poor exhaustion tendencies or very poor affinity for the fiber, then you push it on to the goods by solvating it out. But before you rinse, you set it in some way, either by mordanting or by treatment with resins, or in some other way, to keep the dye permanently fixed on the goods.

You certainly don't go rinsing it after you have gone to all the trouble of putting it on, when it does not want to go on.

By Mr. Schimmel:

Q. As far as your knowledge is concerned in dyeing silk, what was customary with respect to silk-dyeing? Was rinsing customary?

A. Do you mean pure silk?

Q. Yes.

A. Rinsing is customary if dark colors are used.

Q. Rinsing was customary with pure silk?

A. If dark colors are used.

Q. Isn't it true that the cellulose acetate fabrics were artificial silks?

A. They might have been called artificial silks.

Q. They were called artificial silks, weren't they?

A. They might have been; they are not called that today.

Q. Would it be reasonable to assume that those skilled in the art would treat those fabrics the same way they treated silk?

A. No, not at all.

Q. They would not treat them in the same way?

A. Would you treat viscose rayon——

The COURT: Pardon me. It is your function to answer questions, not counsel's.

The WITNESS: Every fiber and every dye has a different manner of treatment.

By Mr. SCHIMMEL:

Q. I will concede that—every dyed fabric. But aren't there some similarities? When a new fabric is developed, hasn't it been your experience that you look to what has been done in the art previously with similar fabrics, to see whether or not the process as used for those fabrics would be applicable to the new fabric?

A. You hope so.

Q. You try?

A. You try.

Q. Don't you as a general rule?

A. You try them generally, but you generally find they don't work, and you have to develop new ones. That was true of acetate, that was true of nylon, and it is now true of orlon—fiberglass. Every new fabric has its own dye problems, believe me.

Q. In connection with your testimony with respect to the British patent number 412.952, which is B in the defendant's folder—that is, the Imperial patent—you stated that that patent was concerned with the dyeing of cellulose acetate in film or sheet form; is that correct?

A. As I read the patent.

Q. You also stated, I believe, that the problems in dyeing sheet material were different from those in dyeing textile materials; is that correct?

A. Yes. I believe I referred to the specification there.

Q. Do you agree with that statement of the specification?

A. Yes. They certainly are different.

Q. Which is more difficult, would you say?

A. Well, in what respect—difficult? Do you mean the cost of machinery?

Q. Difficult to dye—to get the dye in.

The Court: What are you actually comparing now?

Mr. Schimmel: Comparing cellulose acetate in sheet form with cellulose textile fabrics.

By Mr. SCHIMMEL:

Q. I am talking about the difficulty in dyeing—with getting dye into the fabrics. I am not concerned with the economics of the problem.

A. I think if you have the right process for each one, they would be fairly simple.

Q. Would you say that if you had the same process it would be simpler to dye or easier to dye textile fabric than it would be sheet?

A. No, not particularly easier, but your sheet would not stand the solution. It would wrinkle and cause you a great many problems in some respects that textile would not. Textile would cause you problems that sheet would not.

Q. In using a solvating bath for carrying the dye into the cellulose acetate material, would the solvating problem be more difficult with the sheet than with the textile?

A. You mean the same process if you used Abel's process?

Q. Using a fifty-fifty alcohol-water solution in which you have your dye dissolved.

A. You would like to know if it would be more difficult to dye film than cloth—than acetate cloth? Is that your specific question?

Q. That is what I was driving at.

A. To get the same degree of color? Is that also what you mean?

Q. No, not the same degree. Just the question, Is there greater difficulty in dyeing one type of fabric than another type of fabric?

A. Fabric, you mean? Not film as compared to fabric?

Q. What is your definition of "fabric"?

A. Woven web.

Q. You are limiting the term "fabric" to woven fabrics, not knitted fabrics, and things of that sort?

A. Woven or knitted—either.

Mr. SCHIMMEL: I might call Your Honor's attention to the fact that the claims are not limited to textile fabric. The claims call for a fabric broadly; and by definition a fabric is anything that is manufactured. Cellulose acetate sheet is fabric, and the point was made with respect to the type of material that was being processed or dyed in this Imperial British patent that it was talking about sheets, not fabrics, implying undoubtedly that they are talking about textile fabrics, but there is no such limitation in the claims that they are limiting them to textile fabrics.

By Mr. SCHIMMEL:

Q. Have you had any experience with cellulose sheet dyeing?

A. Yes, we have tried some. It is much better to put the dye in the plastic before you mix.

Q. It is a little harder to dye sheet than it is textile fabric?

A. We have lots of trouble with the sheet.

Q. So when you say the patentee says he dyes cellulose sheet by using the specific solution and conditions stated in the patent, and he states he gets a dyed cellulose film, would it be your opinion that that process could be used for cellulose textile fabric or acetate textile fabric?

A. It does not necessarily follow. It might, but you would surely have to try it.

Q. If you tried it and found it worked, it would not be unexpected, either, would it?

A. You mean I would not expect it to work, or I would expect it to work?

Q. You say.

A. I would not expect it to work unless I tried it and saw that it worked.

Q. If you tried it and found it worked, would you call it unexpected, or is it something you would expect from the nature of the materials you were using?

A. No. There is an enormous—If in truth you are talking about continuous film, which he seems to be talking about, there is an enormous difference in the surface area of that sheet—from the small amount of surface area in that sheet—compared with the surface area of a woven or knitted textile, and you certainly would not expect the same coloring results in one case as you would in the other, because you have different surface conditions.

In the second place, your films are oftentimes plasticized in order to be flexible; whereas your fabrics or textiles, if you want to differentiate that way, are flexible by virtue of the fact that they are composed of many, many small filaments.

But a sheet, due to the fact that it is already plasticized, might dye much more easily than unplasticized filaments that you would find in a fabric.

Q. But if you used such a sheet, using an alcohol-water mixture, in which you had dissolved a daylight fluorescent dye, wouldn't you expect that sheet to be solvated by that dye solution?

A. I would expect it to be solvated by the alcohol first.

Q. We are using a mixture of alcohol and water.

A. The aqueous alcohol would probably go into the sheet because it is already highly plasticized.

Q. It would take the dye with it?

A. The likelihood is that it would carry some of the dye, yes.

Q. And dye the sheet?

A. You mean before you removed the solvent, it would dye the sheet?

Q. Immersing it in the dye bath. Say we solvate the film by an alcohol-water bath.

A. If you dry up the dye bath, it would probably color the sheet. Remove the dye bath without removing the dye, and you would color the sheet.

Q. Would you say that was an exhaustion dye process, using those materials?

A. No, I wouldn't say so.

Q. Would you say that was comparable to your dyeing process?

A. Comparable to one stage of it.

By the COURT:

Q. By "one stage," do you mean insofar as the materials are concerned in the immersed——

A. In the immersion, yes.

By Mr. Schimmel:

Q. Would it be, in your opinion, within the skill of the art, when that fabric comes out of the bath, to wash it?

A. Within the skill of the art? Not if you are going for deep shades. You are going to set it, first—set as much color into it as you can, if you are going for deep shades.

Q. This is not an exhaustion dyeing process, is it?

A. No.

Q. What do you have to set, then?

A. You have to set the dye in so that you can get a deep shade. You want to get a lot of color on and make it stay on there.

Q. Setting occurs in this instance how?

A. In the instances of Abel and Dreyfus, they dry it. They remove the solvent by drying it.

Q. The dye is absorbed in the fabric?

A. Some of it may be; some of it is concentrated on the surface of the fabric.

Q. You mean if it is heated after it comes out of the bath?

A. If it is dried after it comes out of the bath.

Q. In any manner?

A. Either if the solvent is drawn off by heat or natural evaporation.

Q. Would any manufacturer put on the market a fabric that has been dried without rinsing it?

A. Without rinsing it after it is dry? He may well rinse it after it is dry.

Q. Would that color come off if it was not rinsed?

A. According to Dreyfus, it does not come off when it is rinsed.

Q. I am asking if it would come off if it were not rinsed after drying.

A. I am stating what Dreyfus says.

The COURT: Counsel has asked you what your opinion is.

By Mr. SCHIMMEL:

Q. I am asking you your opinion as an expert in the art. Would it be suitable to the trade if a fabric of that sort were produced and were not rinsed? Would it be acceptable?

A. Did you ask me whether the color would come off if fixed it by drying, or whether it would be acceptable to the trade without——

Q. Let us review what I had in mind. We have a cellulose acetate fabric that is being dyed according to the process of Abel in a mixed solvent of alcohol and water, with dye dissolved in it. The fabric is dipped into the dye bath, and it is dried, whether it is dried in air or any other way.

Now, subsequent to that drying, would it not be general practice to wring that fabric?

A. Not unless it was a bleeder, because you would have to do—The fabric is dried up; the fabric is ready to go out. The only reason you would rinse it again after that is if it were a bad bleeder. You would want to rinse out any dye that would bleed after you have set it. But once you dry the fabric, you don't want to have to go through the stage of wetting it down again any more.

Q. Wouldn't you take the precaution of rinsing it to make sure it would not bleed?

A. I would test it for bleeding first, and if it did not bleed—if it was as fast as Dreyfus says it is—I would send it out as is.

Mr. SCHIMMEL: May I have Plaintiffs' Exhibit 5?

By Mr. SCHIMMEL:

Q. I believe you are thoroughly familiar with the method by which these exhibits were prepared?

A. Yes.

Q. Exhibit 5-A was prepared according to Abel, and Exhibit 5-B according to Dreyfus.

Would they bleed?

A. In washing? With laundry soap, do you mean?

Q. No, just water.

A. I imagine they would bleed some.

Q. If they were to bleed, wouldn't it be general practice to wash them so as to eliminate the bleeding, before you put them on the market?

A. It would be good practice.

Q. Would you expect a customer to accept one if it was not good practice?

Mr. ELY: That is making an assumption that the things have been put on the market.

The WITNESS: It depends on what he specifies.

By Mr. SCHIMMEL:

Q. Are bleeding fabrics acceptable to the trade?

The COURT: Meaning Abel and Dreyfus?

Mr. SCHIMMEL: Meaning Abel and Dreyfus.

By Mr. Schimmel:

Q. Would they in that condition be acceptable to the trade?

A. I imagine in Abel's time any deep shade that he could get on the textile—on acetate—cellulose acetate—was acceptable, because they could not get deep shades in those days.

Q. Would it be acceptable today?

A. I don't think so.

Q. In connection with the Dreyfus patent, I believe you stated that the object of this patent was to get the maximum amount of dye and to get deep shades?

A. Yes.

Q. Can you point out in the patent where that statement occurs? To save time, it is down at the bottom of page 2.

A. This is page 2, line 67:

> "The colors obtained are quite brilliant and are of great depth for the amount of dyestuff employed. Moreover, the color is surprisingly fast to soaping."

Q. I ask you, What does the word "brilliant" mean in that connection?

A. "Brilliant" means clean, to a dyer. If you have a high tinctorial strength and your dye is clean, they call it brilliant.

Q. Don't you characterize your daylight fluorescent materials as brilliant?

A. We characterize them as daylight fluorescent.

Q. Don't you also use the word "brilliant" in connection with them?

A. Certainly.

Q. Isn't that word——

A. (Interposing): More brilliant than any other colors ever produced before.

Q. Does your use of the word "brilliant" mean something different from Dreyfus' use of the word "brilliant"?

A. Well, "brilliant" is a term which is a matter of degree.

By The Court:

Q. The question is, Is the use of "brilliant" in Dreyfus the same as the use of that term in connection with your application?

A. "Brilliant" does not necessarily mean "fluorescent," if that is what you mean, nor are they used synonymously.

By Mr. Schimmel:

Q. The question is, Is the term "brilliant" as used in Dreyfus the same as is used in connection with your application?

A. I don't know how Dreyfus wanted to use it.

Q. Normally when you in the dyeing field say you have a brilliant color, what do you mean?

A. Clean.

Q. It has no relation to how it appears in daylight?

A. It appears clean. It is pure.

Q. We are speaking of color.

A. That is what I am talking about. A pure color is generally considered a brilliant color. A pure color is one which is not muddied up with gray. It is tinctorially pure. It is considered a pure color. I mean the effect on your eyes as you view the color is one of cleanness.

Q. How do you use the word deep?

A. "Deep" means full—full of color. Very deeply colored means full—having a great deal of color.

Q. It has a lot of color?

A. Yes.

Q. It does not have to be brilliant?

A. Many colors can be full and not brilliant.

Q. So when a colorist is using the word "brilliant," he has something specific and definite in mind, doesn't he?

A. When he uses "brilliant" and "deep," he means it is full and clean.

The COURT: We will take a recess at this time. We will come back at twenty-five minutes after eleven.

(At this time a short recess was taken. The following then occurred:)

By Mr. SCHIMMEL:

Q. Considering the Dreyfus patent a little further, is it your opinion, Mr. Switzer, that Dreyfus was using a higher percentage of dyes in his baths?

A. I believe he says from—I think he says from three-tenths up to——

Q. You may refresh your recollection (handing a paper to the witness).

A. Yes: from a half percent to 3 percent of the weight of the dye bath.

Q. Isn't the greater part of that range similar to the process you disclose in your application?

A. Two-thirds of it is.

Q. Two-thirds of the range that Dreyfus discloses is disclosed in your application?

A. Yes.

Q. In connection with that statement, a reasonable amount of time of immersion or contact of the dye bath with the cellulose acetate fabric, according to Dreyfus, I believe you characterize that as too short to permit swelling of the textile fabric; is that correct?

A. To permit complete swelling. It permits some, I believe.

Q. That is what I was going to ask you. Even in a normal padding operation, when the dye liquid is applied to the fabric by one of the padding rolls, isn't there a sufficient solvating medium there to swell the fabric?

A. You mean in the case of Dreyfus?

Q. Using the usual padding machine, as Dreyfus is speaking about, yes.

A. With the Dreyfus solution?

Q. With the Dreyfus solution; that is correct.

A. I suppose there is some degree of swelling there, not maximum.

Q. You would say it would not be maximum to the extent that it would swell to double its size?

A. Oh, I don't think so.

Q. Isn't it true that Dreyfus also says that he could immerse his fabric in the dye bath itself and then pass it through rollers in the process of dyeing the fabric?

A. That is the way most padders do it. They festoon it down in the dye bath and then in the pad roll.

Q. During the time it is immersed in the dye bath, wouldn't there be considerable swelling of the fibers themselves?

A. It all depends on how fast the goods are run. If they are run very slow and stay in the bath a long time, there will probably be considerable swelling. But we have the problem there of applying pressure to it afterward.

Q. Let us use the usual operations, as Dreyfus is speaking about. He is speaking about the usual padding machines. At the speeds used in those machines, would there be sufficient time to substantially swell the fibers of cellulose acetate?

A. I really don't think so.

Q. Can you give us any idea of what those speeds are?

A. They generally run 20 or 30 yards a minute.

Q. When they are festooned in the bath and pad?

A. Yes.

Q. You are not speaking in those instances or those cases of where the roll itself is immersed in the bath and then applied to the fabric?

A. They still run about that speed, whether you have the rolls immersed, or immerse first and then bring up to the roll.

Q. But even with that speed, you would get some swelling of the fabric, wouldn't you?

A. Oh, I think you would get some.

Q. When you get swelling of the fabric, the dye that is carried by the swelling material into the textile fiber would be in solvated condition in the fiber, wouldn't it?

A. It would be carried in with the swelling, yes.

Q. When the swelling agent comes out, it is left in the fiber, isn't it?

A. Some of it is, I am quite sure.

Q. That which is left in the fiber: isn't that in a solvated condition akin to solution in the fiber, as you yourself have described?

A. The distribution would be the same.

Q. Would its condition?

A. As a solution.

Q. Would its condition be the same?

A. No, because it would not be uniform. It would not be uniformly distributed. The condition of the solution is uniform distribution as well as molecular distribution.

Q. Not the distribution so much as the condition of the dye in the fiber.

A. Some of the dye would be molecularly dispersed.

Q. Dispersed in the solvated fiber?

A. It would be molecularly dispersed, probably.

Q. Would it be molecularly dispersed in the fiber?

A. Probably some of it would be.

Q. The dye in your fabric is molecularly dispersed in the fiber also?

A. Molecularly dispersed and uniformly dispersed.

Q. Do you draw a distinction between "uniform" and "non-uniform" in the Dreyfus case?

A. Yes.

Q. Can you tell us why it would be non-uniformly dispersed in the case of Dreyfus?

A. Because you are getting very high concentration of dye when the solvent evaporates and allows that dye that was contained in the extraneous solvent to come down on the goods, and the goods are slightly melted or fused, or it plaits onto the goods, and you have a good deal more dyestuff on the outer side or outer part of the fiber, or on the outer surface of the fiber, or close to the outer surface, than you have all the way through.

Q. Would that be true if you washed the fiber??

A. Yes, if they hot laundered.

Q. In Dreyfus would it be true?

A. Yes, if it is well bonded.

Q. Wouldn't you expect some dye to come off the surface in the washing operation?

A. In the case of rhodamine?

Q. In the case of Dreyfus. Yes, in the case of rhodamine dye.

A. He says it doesn't, He says it is fast to washing.

Q. Isn't that true after he puts it through other operations?

A. After he dries it, yes. But by drying it, he sets it. He sets that dye into and on the surface.

Q. It would be your opinion, when he speaks of rinsing it after the drying operation, that no dye would come off?

A. That is what he says. He says it is fast to soaping.

Q. I would like to have your opinion on the matter.

A. I think if you follow his process, well, most of it would stay.

Q. You can read what Dreyfus says.

A. That the fabric may then be rinsed or given any other suitable after treatment.

Q. I am speaking of the rinsing.

A. If he got bleeding, what he would do would be to give it more after treatment. He would set it with zinc chloride or some agent which would prevent any bleeding.

Q. In the rinsing operation after drying, would any of the dye come off, in your opinion? I have not had an answer to that question.

A. It might; I don't know.

Q. Would you like to demonstrate on these fabrics here whether the dye would come off, by a rubbing operation, say? Take, for instance, Plaintiffs' Exhibit 5-A.

Mr. Ely: By what?

Mr. Schimmel: By rubbing it.

The Witness: You said something about coming off in rinsing. Now you are talking about crocking.

By Mr. Schimmel:

Q. You have stated that in the operation according to Dreyfus it is a concentration of dye on the surface of the fabric?

A. I am inclined to think there is.

Q. Wouldn't that concentration come off by rubbing or rinsing? I am asking you just to get the fact.

A. Some of it might; but it could be set on with after treatment.

Q. Dreyfus says he rinses the fabric?

A. Or he after treats it.

Q. And rinsing is not after treatment?

The COURT: I think you ought to get a base. This thing is in two parts.

By the COURT:

Q. The fabric may then be rinsed.

A. Yes.

Q. That is complete. That is one way. Or, second, given any other suitable after treatment.

A. Yes.

Q. The question now put by Mr. Schimmel to you is related solely to rinsing.

A. I see.

Q. Can you answer it on that basis?

A. Well, you asked me, if you rinse, will you get dye bleeding?

By Mr. SCHIMMEL:

Q. Will some of the surface dye come off?

A. I think some of it probably would.

Q. Some of it would?

A. Yes.

Q. That is what I was asking. Now, I would like to ask you some questions about your affidavit in connection with the French Patent.

Mr. SCHIMMEL: That is Exhibit F in our folder, Your Honor.

By Mr. SCHIMMEEL:

Q. You testified that you had prepared samples of fabric dyed according to Example 8 of that patent; is that correct?

A. Yes, I believe that is correct.

Q. Do you remember whether or not there was another example in that patent that showed dyeing with Rhodamine B?

A. I believe there was.

Q. Do you remember whether or not the patentee characterized that dyeing as a very fluorescent dyeing?

A. I believe both of them were characterized as being fluorescent.

Q. Can you explain why you did not carry out Example 4?

A. We could not get hold of that particular acid; it was not available.

Q. Can you give us an idea as to whom you inquired of for its availability?

A. I think Mr. Ward could answer that better than I could. I think we went to Eastman.

Q. Did you inquire of Eastman, if you know?

A. I believe we did.

Q. That was in 1945, was it?

A. Whenever we did the work, yes.

Mr. SCHIMMEL: If Your Honor please, I have here a catalogue of Eastman Organic Chemicals, dated 1944, in which is listed on page 49 the availability of cresotinic acid.

By Mr. SCHIMMEL:

Q. Is that the material specified by the French patent?

Mr. ELY: What is that example, Mr. Schimmel?

Mr. SCHIMMEL: Example 4.

The Witness: Example what, is it?

Mr. Schimmel: Example 4.

The Witness: No, that is not the same thing.

By Mr. Schimmel:

Q. If you had cresotinic acid, would it be very difficult for you to make cresotinate?

A. It depends on whether he is talking—maybe further on in the specification he more thoroughly——

Q. I might refer you to page 2 of the translation of the French patent.

A. O.K.

Q. In lines 7 and 8, in the paragraph that starts, "The soluble salts of these same acids have the same properties"—do you have that?

A. Yes.

Q. In the third line down, where he speaks of salts of cresotinic——

A. Yes.

Q. Is that sufficiently defined to describe it, as far as you are concerned?

A. There are different ones, you know. The thing you probably ought to do is try them all—get them all—because you don't know just which one he specifies. He just says, if you assume this is to be salts here, salts of cresotinic acid. Then, in his specification, he says salts of cresotinic acid. So you probably have to try a variety of cresotinic acids.

Q. You could at least have tried the one that was available, couldn't you?

A. For some reason or other, we couldn't get that at the time. I wanted to try it.

Q. May I also call your attention, on page 2 of that same French patent, in line——

A. Page 2?

Q. Yes, in the paragraph beginning, "The substituted homologues of benzene are likewise more active," do you see the third sentence in that paragraph?

A. Yes.

Q. That sentence reads:

> "The cresotinates are more active than the salicylates."

Wouldn't that, in your opinion, be a direction to use that material instead of the salicylates which you did use?

A. Well, do you think we should have tried everything that was mentioned or that he mentions, probably?

By the COURT:

Q. No, sir. The question is—if you can answer it—whether that did not indicate to you that you should have used cresotinate instead of salicylates. In other words, weren't you flagged by that provision?

A. "More active." What do you mean by that? I frankly tried to do the job just exactly the way you are doing it.

By Mr. SCHIMMEL:

Q. Wouldn't that be a flag to anyone skilled in the art, who was reading that specification, that that material, as stated by the patentee, would be more active?

A. That meant you could probably get more dye on.

Q. Wouldn't it be a flag for you to try that, to see what the best results obtainable by the disclosure of that patent would be?

A. If I wanted to get more dye on. You see, his agents, that he puts in there, are acids—are organic acids—which have a certain amount of affinity for the cellulose acetate.

Q. Salt is not an acid, is it?

A. He puts it in as salt just to solubilize it.

Q. When he uses sodium cresotinate, he is not using an acid?

A. No, but it probably goes into the cloth.

Q. We are speaking as to probabilities.

A. He also uses straight acids.

Q. We are talking of sodium cresotinate, which he specifically mentions in Example 4—that specific fluorescent dye. He says he gets fluorescent dyed fabric. We have nothing, as far as your evidence is concerned, which shows that that does not get a fluorescent fabric. Yet the patentee says, apparently, that that is his best material.

A. No; he says that he gets fluorescent dyed fabric in the example that I did try, and, in my opinion, it was not very fluorescent. I think we showed that to the Court. It had a little black light fluorescence, but that is what he probably called fluorescent. He does not comment that one is more fluorescent than the other.

Q. In connection with your statements with respect to the description in the Color Index, in which the dyes were described as being fluorescent and the materials dyed as being fluorescent, and your statement that you believe that those designations of fluorescence are referring to black light fluorescence, have you anything upon which to base that belief?

A. Yes, I think so, sir. That was in 1924, and most of the literature that talks about or reports any fluorescence, is talking about an observation which was made under Wood's glass, and there is no differentiation or tabulation as to degree of fluorescence. There is no differentiation made between those that could not possibly be detected any other way and those that are reported there.

Q. When a dyer speaks of fabric being colored with certain dye, is he talking about how the dye appears under black light or under daylight?

A. He talks about the color as being under daylight.

Q. He is speaking about daylight. So when he gets fabric—silk, we will say—dyed to where he says it has a fluorescence, isn't he still talking about daylight?

A. No, they generally examine under black light.

Q. But his color is according to daylight?

A. What is it?

Q. His color that he speaks of is according to daylight?

A. It is according to daylight, surely.

Q. Why do you jump to black light when he talks about fluorescence?

A. Because that is the classical way of determining fluorescent material, to determine positively that it is not iridescence or it is not some other light phenomenon, but that it is truly fluorescence.

Q. I refer you to the item under Color Index No. 749, in the right-hand column, in which the dyeing of cotton is described. Would you mind reading the statement in that upper portion?

A. "Dyes cotton—mordanted with tannin and tartar emetic bluish-pink without fluorescence, or oiled-cotton bluish-pink with fluorescence."

Q. There is no indication there, is there, that there is any particular type of fluorescence?

A. They don't specify one way or another, on the face of this.

Q. When he says, "No fluorescence," would that be no fluorescence in daylight?

A. No. I think what he means is that under Wood's light it does not show any degree of fluorescence.

Q. When you speak of an alcohol solution of Rhodamine B being fluorescent, are you talking about daylight fluorescence?

A. You could be talking about either one in that case.

Q. What did you describe as the particular material when you were on the stand previously? Were you talking about daylight fluorescence then, when you said an alcohol solution of Rhodamine B was fluorescent?

A. I said it was daylight fluorescent in dilute solution.

Q. So it was daylight fluorescence?

A. What I was talking about, in other words, was that visible light response.

Q. Does that same article say that an alcohol solution of Rhodamine B is fluorescent?

A. Yes.

Q. That, to you, would not mean fluorescence, I suppose, would it?

A. As I say, following their general procedure of reporting fluorescence, it would mean fluorescence under black light, which might also be fluorescent in daylight.

Q. But you would not say the report that it was fluorescent was talking about daylight fluorescence?

A. I don't believe so. I believe they report fluorescence under Wood's light.

By the COURT:

Q. Are you familiar with the book from which this comes?

A. Yes, I am, sir.

Q. Is there any key in there which would indicate that it means it would be under black light, or is that purely deduction on your part?

A. That is deduction on my part, but I believe you could find out, if you go back far enough and study all those references. They give you many literature references there. I have studied the literature references in regard to dyes, and they state they possess red fluorescence under Wood's light or blue fluorescence under Wood's light.

Q. There you have a specification of being under black light.

A. Yes. It is not clear on the face of that just whether—one other reason is that visible light absorption or fluorescence due to visible light was not necessarily appreciated at that time.

By Mr. SCHIMMEL:

Q. May I ask you, then, isn't it true that the fluorescence under visible light is primarily due to the ultra-violet in the visible?

A. No.

Q. I didn't say "all"; I said "primarily."

A. Not primarily. In Rhodamine B it isn't in proper solution. I can put transparent visible light—transparent material over the surface of the daylight fluorescent in any red fabric, which absorbs all of the invisible ultra-violet, or I can illuminate it with monochromatic green light containing no ultra-violet, and it appears red. In that condition, it converts not only the ultra-violet but also the green light. It has got to be in a state of solution; there is just no question about that. In crystal form, it will not convert. It will respond a little to black light, very low order, but it will actually absorb green light where you have nothing but monochromatic green, no ultra-violet at all, and part red, whereas with non-fluorescent—non-daylight fluorescent—the thing would appear black or brown.

Mr. SCHIMMEL: Frankly, Your Honor, I made an investigation to determine what was meant in this Color Index Chart when they speak of fluorescence. Unfortunately, I could not unearth anything to distinguish between the different types of light, whether black light or daylight.

I believe that is all I have of the witness.

The COURT: Are you going to have some redirect, Mr. Ely?

Mr. **Ely**: I think not. Mr. Switzer took care of whatever else needed to be taken care of.

The **Court**: Are you going to have anything further?

Mr. **Ely**: No, sir, I believe not, except that I would like to say this for the record. There are the matters in question by the United States Government and the Canadian Government in connection with the allowance of royalties paid by those governments. Some of the Canadian things I explained at the beginning. We were scheduled to have a gentleman come here from Canada, but because of the uncertainty of my being here, I cancelled that.

I can personally testify to the fact that there was a question of the novelty of these daylight fluorescent materials by the Government bodies. I was the only one present, other than the Government officer. If I could testify on the stand without prejudicing myself, in the position that I find myself in before the Court —and I have no objection to cross examination by Mr. Schimmel within the scope of that——

The **Court**: Of course, if you took the stand and testified, that would preclude you from arguing.

Mr. **Ely**: On that point?

The **Court**: Yes. You want to show what?

Mr. **Ely**: It would show that there had been, other than by the Patent Office——

The **Court**: Other than by the Patent Office?

Mr. **Ely**: It would show that the United States Government, other than the Patent Office, acting under Public Law 768, has considered novelty—and this is after an investigation; we are not talking about the literature—it would be an investigation of the trade, as shown by this historial data sheet. To those skilled in the art, it shows what can be made out of publication, if it is novel.

The COURT: I think if you want to make that showing, you had better call the people here, so that they may be subjected to cross examination. But you have the proposition here that certain of these people have been licensed, and you are receiving royalties.

Mr. ELY: Well, I think we can make enough out of what we do have without putting them on.

The COURT: Then, you rest at this time?

Mr. ELY: Yes.

The COURT: Does the Government have anything?

Mr. SCHIMMEL: Nothing other than the folder on your desk and the Dreyfus patent which is not included in the folder.

The folder I should like to have marked as Defendant's Exhibit 1, and the Dreyfus patent as Defendant's Exhibit 2.

Mr. ELY: As to the first exhibit, I should like to object as far as introducing it is concerned. There are two papers in there that I think are clearly objectionable. They are publications which were published after this application was filed and, therefore, could hardly be construed as any prior art or as something that would affect the subject matter of this case. There is one publication dated 1946, and one dated 1942, both after this application was filed.

Mr. SCHIMMEL: In view of the statement made by the witness, I will withdraw those two publications.

The COURT: Which two are they?

Mr. SCHIMMEL: That is I, "Textile Colorist." That will be eliminated.

The COURT: All right. That will be eliminated, and J will be eliminated. As to the rest of them, there is no objection?

Mr. ELY: No.

The COURT: You said something about Exhibit 2.

Mr. SCHIMMEL: Exhibit 2 would be the Dreyfus patent we have been discussing, number 1,968,819.

(The folder referred to was marked as Defendant's Exhibit 1 and received in evidence.)

(Dreyfus patent No. 1,968,819 was marked as Defendant's Exhibit 2 and received in evidence.)

Mr. SCHIMMEL: Defendant's Exhibit 3 would be a photostat of a page of the Color Index.

The COURT: Is there any objection to that?

Mr. ELY: No objection.

(Photostated page of Color Index was marked as Defendant's Exhibit 3 and received in evidence.)

Mr. SCHIMMEL: That will be all we have.

The COURT: Then, we are in the position where all that is left is the matter of argument. I think we will hear argument tomorrow morning at 10 o'clock.

Mr. ELY: All right. Thank you.

(At 4 p.m., an adjournment was taken until Friday, November 17, 1950, at 10 a.m.)

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

Civil Action No. 597-49

JOSEPH L. SWITZER AND RICHARD A. WARD, PLAINTIFFS

v.

JOHN A. MARZALL, COMMISSIONER OF PATENTS, DEFENDANT

Washington, D. C.,
Friday, November 17, 1950.

The trial of this case was resumed before District Judge Richmond B. Keech, in Civil Division No. 6, at 10 a.m.

APPEARANCES:

On behalf of the plaintiffs: Mr. Albert L. Ely, Jr.

On behalf of the defendant: Mr. Joseph L. Schimmel, Assistant Solicitor, United States Patent Office.

PROCEEDINGS

The COURT: Before you start, gentlemen, do you desire the reporter to report the argument?

Mr. SCHIMMEL: No, I do not think so.

Mr. ELY: No, not unless the Court wishes it taken.

The COURT: No, sir. I am making notes as I go along.

(Mr. Ely made an opening argument on behalf of the plaintiffs.)

(Mr. Schimmel made an argument on behalf of the defendant.)

(Mr. Ely made a closing argument on behalf of the plaintiffs.)

The Court: Thank you, gentlemen. We will treat the case as submitted.

As I view the situation, I do not believe that you have lost anything, notwithstanding the fact that we have talked about this test, with respect to 5-A, 5-B, and 5-C. I do not believe that it is vital to the case.

Mr. Schimmel: I do not believe it is vital to the case, either.

The Court: If that be true, that eliminates the need of a further test. If I thought it was vital to the case, I would give you an opportunity to make it, notwithstanding the fact that the case has been closed.

Mr. Schimmel: Just to clear the record, I might withdraw my objection to the introduction of this color card index, in order to simplify matters, so that it may go in evidence.

The Court: Very well. Then, it will be received.

(Ciba color chart, Plaintiffs' Exhibit 3 for identification, was received in evidence.)

The Court: I think there is nothing else pending by way of exhibits which have not been dealt with.

(At 12:30 p.m. the trial was concluded.)

Certificate of Official Reporter

I certify that the foregoing is the official transcript of proceedings and testimony in the case of Joseph L. Switzer, et al., vs. John A. Marzall, Civil Action No. 597-49, on November 15, 16, and 17, 1950.

Francis J. Attig,
Official Reporter.

SPECIFICATION

This invention relates to an improvement in fluorescent textiles and a method of dyeing textiles with fluorescent dyestuffs.

Brilliantly fluorescent fabrics have long been sought for theatrical costumes and display purposes. Heretofore, even though the dyes employed were brilliantly fluorescent, fluorescent dyed fabrics have been only weakly or faintly fluorescent and have been more or less characterized by a certain muddiness or dullness of color, both under visible light and invisible fluorescigenous radiations, such as ultra-violet light. Consequently, when brilliantly fluorescent fabrics were required heretofore, suitable fabrics were varnished or coated with a coating containing a dispersion of fluorescent dyes or pigments. Such coated fabrics lost flexibility, porosity, and softness; garments made of such coated fabrics were uncomfortable and the coating tended to crack and break during use; such coated fabrics did not have a satisfactory hand and were difficult to drape.

It is an object of this invention to provide a brilliantly fluorescent dyed fabric and a process which will permit textiles, such as cellulose acetate, silk, wool, and the like, to be dyed with most known fluorescent dyes to produce brilliantly fluorescent fabrics. Flourescent fabrics dyed according to our method are particularly clean and pure in color, both under visible light and invisible ultra-violet light and are not appreciably affected by our dyeing process in respect to flexibility, porosity, softness, hand or drape. A further advantage of our fluorescent dyed fabrics is that the nautral shimmer and sheen of textiles, such as satins, for example, is accentuated when dyed with fluorescent dyes by our method.

A still further advantage of our invention is that fluorescent fabrics dyed by our method are not restricted to use in the somewhat narrow field of theatrical costumes and displays. By our process it is possible to dye textiles with dyes which possess the property of "daylight" fluorescence, i.e., such "daylight" fluorescing dyes fluoresce not only under invisible ultra-violet light but also fluoresce to a certain extent under the influence of the shorter wave lengths of visible light. As a result, textiles dyed by our process with "daylight" fluorescing dyes exhibit a brilliance of color which cannot be obtained with ordinary dyes which exhibit color due only to the selective color absorption of the dye.

Other objects and advantages of this invention will be apparent from the following specification, claims and drawings in which:

Fig. 1 is a greatly magnified diagrammatic cross-section of a textile filament dyed according to the prior art methods; and

Fig. 2 is a greatly magnified diagrammatic cross-section of a textile filament dyed according to our method.

As pointed out above, attempts to dye fabrics of the class described with a dyestuff which exhibited brilliant fluorescence in suitable solutions heretofore generally produced a dyed fabric which was only weakly fluorescent and somewhat muddy in color. The same fabric dyed with the same fluorescent dyestuffs by our method produce brilliantly clear fluorescent dyed fabrics. While not restricting ourselves to any one theory or reason for our success, we believe the contrast between the results obtained by the use of our method and the methods of the prior art lies in the fact that in the prior art the problem of dyeing was considered to be primarily one of selecting a suitable dyestuff which, under given conditions, would exhibit an affinity for the fibers or filaments of a particular fabric and, under such conditions, could be affixed to such fibers or filaments more or less permanently in a substantially and generally insoluble state. A filament of a textile so dyed is illustrated diagrammatically in Fig. 1.

In Fig. 1, 10 represents a filament of cellulose acetate and 11 represents molecules of dye affixed to the filament at or on its surface. Where the dye molecules 11 are ones which exhibit color due to the phenomenon of absorption, i.e., where a fractional band or bands of wave lengths of the incident visible light are reflected and the remainder of the visible light is absorbed, such a concentration of dye at the surface of the filament is satisfactory. Where the molecules 11 are ones which exhibit color due to the phenomenon of fluorescence, i.e., where the dye molecules 11 convert incident rays of fluorescigenous energy, usually ultra-violet light, to visible light of longer wave lengths, such a concentration of dye at the surface of the filament 11 is not satisfactory. Many fluorescent dyestuffs are highly colored and, therefore, extremely light absorptive, when in a crystalline or similar highly concentrated state. It is believed that when fabrics are dyed by conventional methods which concentrate the dye molecules at or on the surface of the filaments or fibers, incident fluorescigenous radiation (indicated by the dotted arrows 12) may be absorbed, rather than converted by the phenomenon of fluorescence, or the visible light (indicated by the arrows 14) emitted by some fluorescent dye particles may be largely absorbed by other dye particles.

As a result of our efforts to analyze our fluorescent dyed fabrics and our method of dyeing, we believe that
Per C. the problem of dyeing ∧ fabrics fluorescent is primarily one of avoiding a condition of concentration of dye molecules on the surface of the fiber or filament to be dyed and, instead, obtaining a dispersion of the dye molecules in the fiber or filament so that the dye molecules are probably oriented in the fiber or filament in a relationship similar to the orientation of the dye molecules when the dye is fluorescent in a solution. A filament of a textile so dyed is illustrated diagrammatically in Fig. 2. In Fig. 2, 20 represents a filament of cellulose acetate and 21 represents molecules of a fluorescent dye dispersed in the filament by our process which will be described below. It is believed that thus neither incident fluorescigenous radiation nor emanated visible light will be lost due to an appreciable irreversible absorption of the radiations and the light by the dye molecules. If the unexpectedly brilliant fluorescence of fabrics dyed by our method is due to the orientation of the dye molecules in or on the fibers similar to the orientation of the dye molecules when in solution, we do not know why our method of dyeing causes such orientation of the dye molecules.

Our method of dyeing a textile, cellulose acetate satin, for example, is, in general, as follows: A small quantity of a dyestuff which exhibits the desired fluorescent brightness in a suitable aqueous organic solvent solution is dissolved in an aqueous solution of an ethyl alcohol, for example. The percentage of dye in solution depends upon many factors, such as the affinity of the textile for the dye, the necessary concentration of dye in the textile, and the like, but the percentage of dye in solution is generally less than two percent. If a greater percentage of dye in solution is employed, it has been found that the fluorescent brightness of the dyed fabric is impaired. The aqueous alcoholic solution in which the dye is dissolved is preferably a 40%, by weight, solution, but may vary from approximately 25% to 60%, by weight. Instead of ethyl alcohol we may, of course, use any similar solvent or solvent mixture which is a mutual solvent for the dye and water and which also exhibits a solvent or wetting action on the textile to be dyed. The dye is preferably one which exhibits less solubility in water than in the mutual solvent for the dye and water.

The cellulose acetate fabric is then dipped in the dye bath, preferably by passing a festoon of the fabric through a vat of the dye bath, until the filaments of the fabric are dyed to the extent desired. Apparently, due to the wetting and penetrating properties of the ethyl alcohol as well as its somewhat solvent and swelling action, the molecules of the dye are dispersed in the cellulose acetate filaments. The time the fabric remains in the dye bath, the temperature of the dye bath, the proportion of the ingredients in the dye bath, and the ratio of the weight of the dye to the weight of the fabric are all interrelated factors affecting the penetration and dispersion of the dye molecules in the filaments of the textile and a change in any one will change the extent of penetration of the filaments by the dye. After the cellulose acetate fabric has been dipped in the dye bath, it is quickly flushed with cold water to "kill" the dyeing action. All of the dyeing liquid on the textile is thus washed off and the formation of dye crystals on the surface of the filaments is prevented. The fabric is then tentered, dried, and finished in the usual manner.

While the foregoing general description has dealt with the dyeing of cellulose acetate, it is not to be understood that this method is limited to this specific textile. Other textiles may be advantageously dyed by this process as will be apparent from the following specific examples. While this invention is primarily concerned with the dyeing of textiles, i.e., woven fabrics, it is to be understood that any fabrics or organic fibers or filaments, such as knitted fabrics, felts, yarns, or loose flock may be dyed by this method. Further, it is to be understood that the following specific illustrations are given by way of example and are not to be considered as being limitative either in respect to the textiles named or the fluorescent dyes employed.

Example No. 1:

One-tenth of one percent (0.1%) by weight of meta diethylaminophenol phthalein is dissolved in a 40%, by weight, solution of ethyl alcohol in water to provide a dye

Rhodamine B

bath. To dye cellulose acetate fabric, a sufficient quantity of dye bath is employed so that the ratio of the fabric to the dye bath, by weight, will be approximately 15 parts of cellulose acetate to 40 parts of the dye bath. With the dye bath maintained at room temperature, the cellulose acetate fabric is immersed in the dye bath for 20 minutes and is then quickly and thoroughly flushed with cool water to remove all traces of the dye bath. The fabric is then tentered and calendered in the usual manner. Cellulose acetate fabric so dyed fluoresces a
brilliant red under ultra-violet light and, un-
Per A. der visible white light exhitits a brilliant
suggested by the name
fluorescent red color best ∧ "Neon Red".

Example No. 2:

Two-tenths of one percent (0.2%) by weight of ethyl
ester of meta monoethylaminophenol
Rhodamine 6 G phthalein is dissolved in a 55%, by
C. I. 752 weight, solution of ethyl alcohol in
water to provide a dye bath. To dye silk fabric, a sufficient quantity of dye bath is employed so that the ratio of the fabric to the dye bath, by weight, will be approximately 15 parts of silk to 60 parts of the dye bath. With the dye bath maintained at room temperature, the silk fabric is immersed in the dye bath for 10 minutes and is then quickly and thoroughly flushed with cool water to remove all traces of the dye bath. The fabric is then tentered and calendered in the usual manner. Silk fabric so dyed fluoresces a brilliant salmon under ultra-violet light and

exhibits a slightly fluorescent red color under visible white light.

Example No. 3:

Per C

Eight one-hundredths of one percent (0.08%) by weight of p,p′ di p″ (p‴ aminobenzoylamino) benzoylamino stilbene o,o′ di (sodium sulphonate) is dissolved in a 40%, by weight, solution of glycerine in water to provide a dye bath. To dye cotton fabric, a sufficient quantity of the dye bath is employed so that the ratio, by weight, will be approximately 15 parts of cotton to 40 parts of the dye bath. With the dye bath maintained at approximately 40° C., the fabric is immersed in the dye bath for 20 minutes and is then quickly and thoroughly flushed with cool water to remove all traces of the dye bath. The fabric is then tentered and calendered in the usual manner. Cotton fabric so dyed fluoresces a brilliant blue under ultra-violet light and is substantially uncolored by the dye, except for a slight blue fluorescence, under visible white light.

Example No. 4:

C. I. 655

Twelve one-hundredths of one percent (0.12%) by weight of imino di(p-dimethylaminophenol) methane hydrochloride is dissolved in a 35%, by weight, solution of acetone in water to provide a dye bath. To dye wool fabric, a sufficient quantity of dye bath is employed so that the ratio of the fabric to the dye bath will be approximately 15 parts of wool to 90 parts of dye bath. With the dye bath maintained at 50° C., the wool fabric is immersed in the dye bath for 20 minutes and is then quickly and thoroughly flushed with cool water to remove all traces of the dye bath. The fabric is then tentered and calendered in the usual manner. Wool fabric so dyed is brilliantly yellow-green under ultra-violet light and exhibits a brightly fluorescent yellow color under visible white light.

Example No. 5:

One-tenth of one percent (0.1%) by weight of imino di(p-dimethylaminophenol) methane hydrochloride is dissolved in a 35%, by weight, solution of isopropyl alcohol in water to provide a dye bath. To dye cellulose acetate fabric, a sufficient quantity of dye bath is employed so that the ratio of the fabric to the dye bath will be approximately 15 parts of fabric to 90 parts of dye bath. With the dye bath maintained at 50° C., the cellulose acetate fabric is immersed in the dye bath for 15 minutes and is then thoroughly flushed with cool water to remove all traces of the dye bath. The fabric is then tentered and calendered in the usual manner. Cellulose acetate fabric so dyed is brilliantly yellow-green under ultra-violet light and exhibits a brightly fluorescent yellow color under visible white light.

Example No. 6:

One-tenth of one percent (0.1%), by weight, of meta methylethylaminophenol phthalein is dissolved in an aqueous solution containing 10%, by weight, of ethylene glycol monomethylether and 15%, by weight, of methyl alcohol to form a dye bath. To dye cellulose acetate fabric, a sufficient quantity of dye bath is employed so that the ratio of the fabric to the dye bath, by weight, will be approximately 15 parts of cellulose acetate to 40 parts of dye bath. With the dye bath maintained at 18° C., the cellulose acetate fabric is immersed in the dye bath for 10 minutes and is then quickly and thoroughly flushed in cool water to remove all traces of the dye bath. The fabric is then tentered and calendered in the usual manner. Cellulose acetate fabric so dyed fluoresces a brilliant red-orange under ultra-violet light and exhibits a strong fluorescent red color under visible white light.

Example No. 7:

Fifteen one-hundredths of one percent (0.15%), by weight, of meta monobutylaminophenol phthalein is dissolved in a 40%, by weight, solution of ethyl alcohol in water to form a dye bath. To dye cellulose acetate fabric, a sufficient quantity of dye bath is employed so that the ratio of the fabric to the dye bath, by weight, will be approximately one part of cellulose acetate to two parts of dye bath. With the dye bath maintained at 20° C., the cellulose acetate fabric is immersed in the dye bath or the dye bath is padded on the cellulose acetate for 20 minutes and is then quickly and thoroughly flushed with cool water to remove all traces of the dye bath. The fabric is then tentered and calendered in the usual manner. Cellulose acetate fabric so dyed fluoresces a bright pastel orange under ultra-violet light and exhibits a fluorescent pink color under visible white light.

From the foregoing, it is apparent that other

daylight fluorescent
∧ dyes exhibiting a lesser solubility in water than in a mutual solvent for the dye and water may
Per C be employed to dye the same or other fabrics and textiles, the proportions of the dye, water and the mutual solvent in the dye bath, the time the fabric remains in the dye bath and the temperature of the dye bath being determinable by ex-
Insert C^1 perience in each instance. C^1 [It is apparent, therefore, that this invention is not limited to the particular examples disclosed, but by the following claims.]*

In the foregoing specification and the following claims, the term "strong", when applied to an aqueous solvent solution, denotes a solution in which the percentage of nonaqueous solvent or solvent mixture ranges from approximately 25% to 60%, by weight, of the aqueous solvent solution; when such strong aqueous solvent solutions are employed in a dye bath for cellulose acetate fabric, the percentage of non-aqueous solvent, by weight, preferably ranges from
Insert C^2 approximately 35% to 40%. C^2 The term "cool", when applied to the water for flushing the dye bath from the fabric, is intended to denote water having a temperature less than approximately 100° F.; preferably water having the temperature of ordinary tap water, i. e., from 55° to 75° F., is usually employed. The term "daylight fluorescent" is employed to denote the phenomenon exhibited by materials which not only reflect portions of the spectrum of

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* Matter enclosed in brackets struck out in copy.

incident visible light but simultaneously
Per C fluoresce under the influence of the incident
light. It is apparent, therefore, that this
invention is not limited to the particular examples disclosed, but by the following claims.

WHAT IS CLAIMED IS:

1. The process of dyeing to produce a fluorescent fabric comprising the steps of providing a dye bath by dissolving a fluorescent dye in a strong aqueous solution of a mutual solvent for said dye and for water, said dye being characterized by a greater solubility in said mu-
tual solvent than in water, immersing fabric
Sub C^3 to be dyed in said dye bath, and then flushing
said fabric with water to remove said dye bath.

2. The process of dyeing to produce a fluorescent fabric as defined in claim 1 in which said mutual solvent swells the fabric to be dyed.

3. The process of dyeing to produce a fluorescent fabric as defined in claim 1 in which said mutual solvent wets the fabric to be dyed.

daylight
4. The process of dyeing to produce a ^ fluorescent
fabric comprising the steps of providing a dye
daylight
Per C bath by dissolving a ^ fluorescent dye in a
strong aqueous alcoholic solution, said dye be-
ing characterized by a greater solubility in alcohol than
in the dye bath
in water, immersing ^ a fabric, characterized by its

tendency to be swollen by the aqueous alco-
Insert C^4 holic solution, C^4 [in the dye bath,]* and
cool
" A Per C then flushing the fabric with ∧ water to
remove said dye bath.

5. The method of dyeing a fabric as defined in claim 4 in which the alcohol in the aqueous alcoholic solution is substantially forty percent by weight.

6. The method of dyeing cellulose acetate fabric com-
prising the steps of providing a dye bath by
daylight fluorescent
Per C dissolving a ∧ dye in a strong solution of a
solvent and water, said dye being characterized
by its lesser solubility in water than in said solvent in
which solvent said dye, water and cellulose acetate are
in said dye bath
Per C each soluble, immersing ∧ cellulose ace-
Insert C^5 tate fabric C^5 [in said dye bath,]* and then
flushing said cellulose acetate with water
to remove said dye bath.

7. The method of dyeing cellulose acetate fabric com-
daylight fluorescent
prising the steps of, dissolving a ∧ dye,
Per C characterized by a greater solubility in alcohol
" A than in water, in a strong solution of alcohol
in water to form a dye bath, immersing cellu-
Insert C^6 lose acetate fabric in said dye bath, C^6 and
flushing said cellulose acetate fabric with
cool water to remove said dye bath.

---

* Matter enclosed in brackets struck out in copy.

to provide a daylight fluorescent fabric
8. The method of dyeing cellulose acetate fabric ^
comprising the steps of providing a dye bath by
Per C dissolving a fluorescent dye derived from dialylaminophenol in a strong aqueous solution of
Insert C^7 alcohol, C^7 immersing cellulose acetate fab-
Insert C^8 ric in said dye bath, C^8 and then flushing
said cellulose acetate fabric with cool
water to remove said dye bath.

to provide a daylight fluorescent fabric
9. The method of dyeing cellulose acetate fabric ^
comprising the steps of providing a dye bath
Per C by dissolving a fluorescent dye derived from
monoalkylaminophenol in a strong aqueous
Insert C^7 solution of alcohol, C^7 immersing cellulose
Insert C^8 acetate fabric in said dye bath, C^8 and then
flushing said cellulose acetate fabric with
cool water to remove said dye bath.

10. The method of dyeing cellulose acetate fabric
to provide a daylight fluorescent fabric
^ comprising the steps of providing a dye
Per C bath by dissolving a fluorescent dye derived
from diethylaminophenol in a strong aque-
Insert C^7 ous solution of alcohol, C^7 immersing cellu-
Insert C^8 lose acetate fabric in said dye bath, C^8 and
then flushing said cellulose acetate fabric
with cool water to remove said dye bath.

11. As a composition of matter, a dyed fabric com-
daylight
prising a fabric of organic filaments and a ^
Per C fluorescent dye dispersed in said filaments of
said fabric, said dye exhibiting a lesser solu-

bility in water than in an organic solvent for said dye and water, said dye being so arranged and oriented in said filaments of said fabric that said fabric exhibits daylight fluorescence.

12. As a composition of matter, a dyed fabric comprising a fabric of cellulose acetate filaments
daylight
Per C and a ^ fluorescent dye dispersed in said
filaments, said dye exhibiting a lesser solubility in water than in an organic solvent for said dye and water, said dye being so arranged and oriented in said filaments of said fabric that said fabric exhibits daylight fluorescence.

13. As a composition of matter, a dyed fabric comprising a fabric of cellulose acetate filaments and a fluorescent dye derived from monoalkylaminophenol so dispersed and oriented in said filaments that said fabric exhibits daylight fluorescence.

14. As a composition of matter, a dyed fabric comprising a fabric of cellulose acetate filaments and a fluorescent dye derived from dialkylaminophenol so dispersed and oriented in said filaments that said fabric exhibits daylight fluorescence.

15. As a composition of matter, a dyed fabric comprising a fabric of cellulose acetate filaments and a fluorescent dye derived from diethylaminophenol so dispersed and oriented in said filaments that said fabric exhibits daylight fluorescence.

JOSEPH L. SWITZER,
RICHARD A. WARD.

(Here follows 1 photostat fol. 18)

154A

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Fig.-1

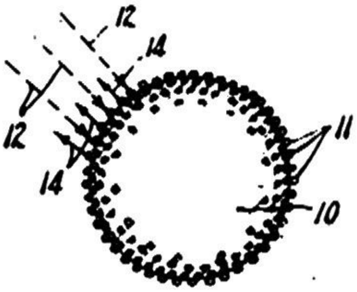
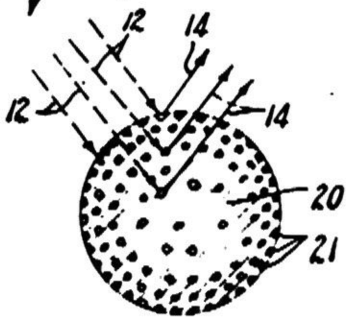


Fig.-2



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Div. 43, Room 7880. Paper No. 15

DEPARTMENT OF COMMERCE, UNITED STATES PATENT OFFICE

Washington 25, D. C.

In re application of: JOSEPH L. SWITZER, et al., Ser. No. 430,792. Filed Feb. 13, 1942. For: FLUORESCENT TEXTILES

Before the Board of Appeals on Appeal No. 13962

EXAMINER'S STATEMENT

This is an appeal from the final rejection of claims 4-8, 10-12 and 14-17 as unpatentable over the prior art. Claims 9 and 13 are drawn to non-elected species. These are all the claims in the case.

* * * * * * *

The references applied are:

Rhodiaseta (Fr.)	579,896	
Rivat (Fr.)	847,107	June 26, 1939
Ellis	2,053,276	Sept. 8, 1936
Abel (Br.)	1939 of 1906	
Imperial (Br.)	412,952	July 5, 1934
Paine	2,089,413	Aug. 10, 1937

The alleged invention relates to a method of obtaining a daylight fluorescent fabric by dyeing with a daylight fluorescent dye in an aqueous alcoholic solution (20 to 60% alcohol) and the fabric so obtained. The fabric must be one that is swollen by the alcoholic solution and the preferred fabric is cellulose acetate. The fabric after being dyed is washed with cool water.

A daylight fluorescent dye is one that will fluoresce not only under ultra-violet light but also to a certain extent under the influence of the shorter wave lengths of visible light. For example, a red dye of this type may reflect the usual amount of red light and emit an additional amount of red light which is due to the fact that a certain amount of visible light shorter in wave length than red incident on the fabric has been changed into red by the phenomenon of fluorescence. These dyes are therefore among the most brilliant dyes known.

Some of the dyes used by applicants are among the oldest dyes of the class of basic dyes and have always been recognized as especially brilliant. They have lost popularity however because of their fugitivity in light. These are Rhodamine B, Auramine O and Rhodamine 6 G (Examples 1, 4 and 2 respectively). The dyes of examples 6 and 7 are closely related to the Rhodamines.

The dyeing of cellulose acetate fabrics with dye baths which contain swelling agents for the acetate fibers is old and is the definition of class 8, subclass 59. The swelling agents are usually organic solvents.

The British Abel patent shows the dyeing of cellulose acetate fabrics with various basic dyes in an aqueous alcoholic solution of 50% strength. The dye may be "rhodamine," page 2, line 20.

Example 3 is the only example which shows any treatment after dyeing. Here the solution is 50% alcohol and the material is washed after dyeing. The dye, however, is not related to the Rhodamines or the other dyes shown by applicants.

The British Imperial patent shows the dyeing of cellulose acetate film with two of applicants' dyes, Rhodamine B and Auramine O, in a fifty percent aqueous alcoholic solution. The permissible percentage of alcohol is from 33 to 66%.

The patent states that methods hitherto used for dyeing fibrous cellulose acetate cannot be used for dyeing films as the film has less exposed surface area and greater thickness. There is nothing in the disclosure, however, which implies that fibers could not be dyed by the same method. In fact, if anything, the implication is that since it is easier to dye fibers they could even more easily be dyed by the process disclosed.

The Imperial patent does not show the step of washing the dyed fabric.

French patent to Rhodiaseta discusses the prior art in the first three paragraphs and therein states that it is known that the affinity of cellulose acetate for basic dyes may be augmented by a preliminary treatment with a 50% alcohol or acetone solution (formic and acetic acid act similarly).

The patented process is one in which various aromatic acids and salts are added to an aqueous solution of a basic dye and the acetate fabric is then dyed while the dye bath is kept at 65° temperature. In examples 4, 5, 6, 7 and 8 applicants' Rhodamine B and Auramine O are used and in examples 4 and 8 the fabric is described as "very fluorescent."

Example 13 shows the preliminary type of treatment in which the fabric is first swollen and then dyed. It shows that the art recognizes the analogy between the type of dyeing in which the fabric is swollen before dyeing and the type in which swelling accompanies the dyeing; thus indicating that it would not be inventive to use the old swelling agents mentioned, such as alcohol or acetone, as the swelling agents in the simultaneous swelling-dyeing baths of examples 4 to 8.

It is clear to anyone skilled in the art that Rhodiaseta's agents are swelling agents as they are compared to well-known swelling agents and in the last paragraph of column 1, page 1, it states that many of these agents are good solvents for cellulose acetate. A poor solvent for cellulose acetate merely swells the fiber no matter what concentration thereof is used; a good solvent is a very strong swelling agent for cellulose acetate. The first stage in the dissolution of cellulose acetate is accompanied by a swelling of the fibers. This permits the dyestuff to enter into and dissolve in the fibers.

The Rivat patent is cited for nothing more than to show that it is old to wash the cellulose acetate after being dyed in a swelling dye bath with copious amounts of cold water and that solvents for cellulose acetate are also swelling agents (page 1, lines 36-50 and page 2, lines 42-46).

The Paine patent shows the treatment of cotton with a compound that is chemically related to that of applicants' example 3. The result obtained is the same as that described in example 3, a bluish fluorescence under ultraviolet light and white under daylight. It is used primarily to show the recognition of a maximum fluorescence and a diminishing fluorescence with amounts of fluorescent material in excess of the maximum (page 1, column 1, lines 28-46).

The Ellis patent shows the dyeing of cellulose acetate with anthraquinone dyes in swelling baths. The preferred swelling agents are organic amino compounds but alcohol is a recognized equivalent (page 1, lines 17-29). After dyeing the fabric is "washed off thoroughly" (Example, lines 58-60).

All of the claims are deemed unpatentable over the French patent to Rhodiaseta. It is not deemed inventive to use alcohol as the swelling agent in the French process when it is one of the older swelling agents disclosed in the very same patent.

This French patent shows no washing except in Example 2 which is a different type of process but washing (or flushing) after dyeing is a conventional step. Paine shows it in Example 1 and Rivat and Ellis show the washing of acetate fabrics after dyeing with swelling dye solutions.

Applicants have submitted an affidavit to show an unexpected advantage over the French process. In view of the closeness of the reference, even if there were such an advantage the claims would still be deemed unpatentable. No unexpected advantage has been shown.

The affidavit states that in trying the French process it was difficult to avoid the formation of tarry precipitates. This difficulty could have been avoided by noting lines 37-44 of page 2 of the French patent.

The samples attached to the affidavit show that the

French product was much paler and did not have the fluorescence of applicants' product. This was to be expected as the French product is described as rose-colored and the percentage of dye in the dye bath of the French patent is .017% as compared to applicants' .15%.

All of the claims are deemed unpatentable over the British Imperial patent which uses applicants' dye bath to dye cellulose acetate film. Since the patent states that fabrics are easier to dye than films the implication is clear that the same dye bath could be used to dye fabrics.

While the Imperial patent shows no flushing this is a conventional step and is shown by Rivat and Ellis. There is no unobvious advantage in this step. The amendment to line 9 from the bottom of page 12 shows that it is done to prevent injury to the fabric by the strong dissolving or swelling action of the alcoholic solution. The same reason for flushing is given by Rivat in lines 42-46 of page 2. It should be noted that Rivat uses cold water to flush the dyed fabric.

Some of the claims specify that the percentage of dye in the bath does not exceed two percent. This is in fact a very high percentage of dye and no reference of record exceeds this percentage.

In some of the claims the phrase "in a state akin to solution" can be found. In others the dye is said to be "so arranged and oriented in said filaments of said fabric that said fabric exhibits daylight fluorescence."

Another defect in the affidavit is that while the French process uses a 65° Centigrade dye bath the affidavit does not say whether the bath is 65° Centigrade or Fahrenheit.

All of the claims are deemed unpatentable over the Rhodiaseta patent in view of the British Abel patent. It is not thought to amount to invention to use Abel's alcohol solution as the swelling agent in the French process particularly as both patents refer to the same dyestuffs, basic dyestuffs, to which class all of the dyes for acetate fabrics shown by applicants belong, and the French patent itself mentions the prior art use of alcohol in dyeing cellulose acetate fabrics.

From another viewpoint the claims are deemed unpatentable over Abel in view of the Rhodiaseta patent. The Abel patent shows the dyeing of cellulose acetate fabrics with a 50% alcoholic solution of a basic dyestuff. The dyestuff may be "rhodamine." Admittedly there are some eight or nine Rhodamines but almost all are fluorescent. At any rate it would not be inventive to use the Rhodamine B of the Rhodiaseta patent as the "rhodamine" in the Abel process if one wanted the "very fluorescent" effect taught by Rhodiaseta.

While these phrases are none too clear in meaning they are thought to refer to the fact that the filaments are deeply dyed. All of the theories of the dyeing of cellulose acetate with non-mordanted dyestuffs of which the Examiner is aware recognize that such unmordanted dyes dissolve into the fiber. In the dyeing of any fiber mere surface deposition of dyestuff is avoided.

At any rate it is thought that the references do teach the dyeing of cellulose acetate fabrics with daylight fluorescent dyes from alcoholic solutions and that such "orientation" or "solution" is inherent in the process.

Certainly there is nothing in the claims or specification to suggest that some condition other than swelling is necessary to obtain the desired "orientation."

Applicants have stated that alcoholic dyeing of cellulose acetate is obsolete. This is not so. In the pad dyeing of cellulose acetate it is still very commonly used.

For the aforesaid reasons it is believed that the rejection of claims 4-8, 10-12 and 14-17 as unpatentable over the prior art was proper and affirmation thereof is respectfully requested.

Respectfully submitted,

N. A. ASP,
Actg. Examiner, Div. 43.

AW/ns.

DEPARTMENT OF COMMERCE

UNITED STATES PATENT OFFICE

Washington 25, D.C.

BEFORE THE BOARD OF APPEALS

In re application of Joseph L. Switzer et al., Serial No. 430,792. Filed Feb. 13, 1942. For: FLUORESCENT TEXTILES

REPLY TO BRIEF

It is noted that applicants quote Trotman in order to refute the holding that cellulose acetate is generally dyed by a solid solution of the dye in the fiber. The quotation from Trotman is entirely irrelevant. Saponified cellulose acetate is not cellulose acetate. It is regenerated cellulose and its dyeing properties are as dissimilar to those of cellulose acetate as to those of wool.

To support the Examiner's position the following statement can be found on page 472 of the 1946 edition of Trotman, "According to Green, the dyeing of acetyl rayon is in general most easily explained by the solution theory. Nearly all of the substances which dye it are soluble in benzene or a hydrocarbon solvent."

The Textile Colorist for December 1942 says on page 559, "In considering the dyeing properties of acetate rayon it is useful to take the view that each fiber acts towards the dyes applied to it as a solid organic solvent, and in dyeing the rayon extracts the dyes from the dye liquor in just the same manner as ether extracts aniline—."

The solution theory for the dyeing of cellulose acetate fibers is the only theory that is widely held.

While the French patent 579,896 is not "the principal reference," the other references being equally good, it is not a bad reference. Applicants could easily have tested the acids and salts to see if they are or are not solvents for cellulose acetate. If they are, they are swelling agents and the French patent says they are solvents.

As for the combination of Abel and French 579,896 even if the assistants are proven not to be equivalent in function it is still not deemed inventive to try the French Rhodamine B as the rhodamine of the Abel process if strong fluorescence is desired.

In the affidavit of Mr. Switzer he states that the alcohol, acetone, concentrated acetic and formic acid, ammonium thiocyanate of the French 579,896 patent were used as wetting out agents. Each one of these is used today in swelling dyebaths for cellulose acetate and they are the most commonly used swelling agents (U.S. patents 2,428,835; 2,428,833; 2,182,964). In 1910 it was known that such pretreatments with alcohol, acetic acid or acetone worked because they swelled the fibers as shown by U.S. patent 961,244. The French patent is dated 1924 and it compares its assistants with these well known swelling agents.

The Imperial patent does not show flushing but such flushing is conventional. Actually the flushing step has never been shown to be critical. Judging by recent patent literature the most common method now employed to remove ethyl alcohol from the acetate fibers is to dry them rapidly. It is thought that rapid drying could be used instead of "flushing" in applicants' process. At any rate flushing is old and, contrary to applicants' assertion, is shown in Abel (example 3) as well as in Rivat and Ellis.

Up until now applicants have not asserted that flushing is necessary to avoid surface concentration of the dye. Its purpose was said to be the avoidance of coalescing of the filaments (see amendment to page 1 of the specification, line 9 from the bottom and the last paragraph of page 4, of paper 10). Since rapid drying is also employed for this purpose it is thought that applicants' statement as to the necessity for flushing to avoid surface concentration of the dye stuff should have been supported by evidence.

I. G. Stone,
Examiner.

AW/ns.

BEFORE THE BOARD OF APPEALS

Ex parte Joseph L. Switzer and Richard A. Ward

Application for Patent filed February 13, 1942, Serial No. 430,792. Fluorescent Textiles

Messrs. Ely & Frye for applicants.

This is an appeal from the action of the Examiner finally rejecting claims 4 to 17, inclusive.

Claims 4 and 7 will serve as representative.

4. The process of dyeing to produce a daylight fluorescent fabric comprising the steps of providing a dye bath by dissolving a daylight fluorescent dye in a strong aqueous alcoholic solution, said dye being characterized by a greater solubility in alcohol than in water, immersing in the dye bath a fabric, characterized by its tendency to be swollen by the aqueous alcoholic solution and to absorb said dye in a state akin to solution, maintaining the temperature of said dye bath below that which swells the filaments of said fabric to coalescence, and then flushing the fabric with cool water to remove said dye bath.

7. The method of dyeing cellulose acetate fabric comprising the steps of dissolving a daylight fluorescent dye, characterized by a greater solubility in alcohol than in water, in a strong solution of alcohol in water to form a dye bath, immersing cellulose acetate fabric in said dye bath, said dye bath and said fabric being proportioned so that the maximum possible absorption of dye into said fabric cannot exceed 0.8%, by weight, of the fabric, maintaining said dye bath

below that temperature at which said dye bath swells the filaments of the fabric to coalescence, and flushing said cellulose acetate fabric with cool water to remove said dye bath.

The references relied upon are:

Abel, (Br.), 1,939, Nov. 15, 1906,
Rhodiaseta, (Fr.), 579,896, Aug. 16, 1924,
Imperial, (Br.), 412,952, July 5, 1934,
Ellis, 2,053,276, Sept. 8, 1936,
Paine et al., 2,089,413, Aug. 10, 1937,
Rivat, (Fr.), 847,107, June 26, 1939.

The appealed claims, which are all of the claims in the case, are drawn to a process for dyeing a fabric, such as cellulose acetate, with a daylight fluorescent dye to produce a daylight fluorescent fabric. The process comprises essentially dissolving a daylight fluorescent dye in a strong aqueous alcoholic solution to produce a dye bath and immersing in the dye bath a fabric which has a tendency to be swollen by the dye bath solution and to absorb the dye in the swollen state. As indicated above, cellulose acetate is illustrative of such a fabric and after immersion in the bath the temperature is maintained below that which would swell the filaments of the fabric to the point of coalescence, after which the fabric is flushed with cool water to remove the surface-adherent dye bath therefrom. The amount of alcohol in the aqueous alcoholic solution is substantially 40% by weight and the proportion of dye bath to fabric is such that the maximum possible absorption of dye into the fabric cannot exceed 0.8% by weight of the fabric. The type of fluorescent dye contemplated by appellants is that derived from mono or dialkyl amino phenol, such as the rhodamine dyes, which exhibit daylight fluorescence.

The Examiner has cited a number of references to show the prior state of the art with regard to the dyeing of cellulose acetate filaments and fabrics and it appears that the principal references relied upon are the British patent to Abel, the French patent to Rhodiaseta and the British patent to Imperial Chemical Industries Limited, the latter being referred to hereinafter as the Imperial patent.

Abel was concerned with the dyeing of acetylated cellulose in the usual manner, by which Abel appears to mean the bath process. This patent points out that cellulose acetate cannot be dyed from aqueous solution, neither can it be satisfactorily dyed from an alcoholic solution alone, but from a dye bath comprising the combination of water and ethyl alcohol, good dyeings result. It is stated that this typical result occurs with methylene-blue and many other dyestuffs as, for instance, with rhodamine and others. Other solvents besides ethyl alcohol may be used, namely, methyl alcohol, acetone or acetic acid. By selecting a suitable organic dyestuff, deep tints are said to be obtained from such mixtures. The first example of this patent discloses a dye bath composed of 200 parts of water and 150 parts of alcohol and containing methylene-blue, a basic dyestuff. In this dye bath 10 parts of acetylated cellulose are treated at ordinary temperature during about a quarter of an hour to produce a deep blue tint on the fabric. As pointed out by the Examiner, the patentee does not disclose a final washing or rinsing step although such a step is shown in Example 3 of this patent which employs an acid dyestuff rather than a basic dyestuff. With regard to the depth of tint obtained, Abel points out that this factor depends upon the proportion of the dyestuff to be dissolved in the dye bath, the duration of the dyeing process and other considerations. While the term "rhodamine" is used broadly in this patent disclosure, nothing is said about daylight fluorescent dyes.

The French patent to Rhodiaseta discusses briefly the use of an aqueous solution of 50% alcohol or acetone in dye baths for cellulose acetate, but instead of using this well known technique Rhodiaseta discovered that a great many substances which are good solvents for cellulose acetate may be used for imparting to cellulose acetate a strong affinity for coloring matters, especially the basic dyes. The patentee points out that the fabric may be immersed in an aqueous bath containing one or more of the active compositions to which his disclosure relates, before dyeing, or these active materials may be added directly to the dye bath. It appears that certain precautions should be taken in following the patentee's process, such as introducing the activating substance little by little in the bath in the form of a solution in those cases where the dye might be precipitated by the activator and especially when it is desired to obtain very deep dark colors. This patent also discloses the use of Rhodamine B to produce dyeings having fluorescence such as this dye produces. It may also be noted that certain of the other dyes contemplated by Rhodiaseta are those mentioned by Abel, referred to above, such, for instance, as methylene-blue. This patent, like the Abel patent, does not disclose washing after dyeing, but the principal invention disclosed therein appears to reside in the substitution in the cellulose acetate dyeing art of certain compounds in aqueous solution as substitutes for ethyl alcohol and its equivalents theretofore known and used in dye baths for this material. The patentee discloses that the conditions of dyeing may be varied and the use of fluorescent dyes is shown.

The British Imperial patent is likewise concerned with the dyeing of cellulose acetate and a method is there disclosed by which this material may be satisfactorily dyed without damage to the material. In this patent the fabric is immersed for a short period of time of the order of a minute or less in a solution of a basic dye in a mixture of alcohol and water containing substantially equal parts by volume of the two at a moderate temperature. The temperature is of the order employed by the appellants while the period of immersion may vary according to the depth of shade required and the thickness of the material to be penetrated. While substantially equal parts of water and alcohol are preferred, this proportion may be varied although the range is kept within the limits of two parts by volume of either one to one part of the other, which is within the range disclosed and claimed by the appellants here. This reference shows among the basic dyes contemplated Rhodamine B which appellants use. With regard to the conditions under which the dyeing is carried out, this patent states that the preservation of the surface of the film or sheet to be dyed is usually essential so that warping or cockling should be avoided. In the example, the temperature is adjusted to 30°C.

and the film is passed through the bath in a minute or less so as not to damage the surface thereof. It therefore appears that the patentee was concerned with avoiding destruction or injury of the material being treated, as are also the appellants in this case.

The other references cited by the Examiner were apparently relied upon to show the subsequent washing step employed by appellants in the dyeing of cellulose acetate in a dye bath containing alcohol and water. Ellis discloses the dyeing of cellulose acetate in a bath which has a solvent or softening action on the cellulose acetate fabric as well as a solvent action for the dye. The solvents he uses are the same or similar to those disclosed in the present application, namely, methyl or ethyl alcohol and various ketones. Acetic acid may also be used. This reference is not concerned with daylight fluorescent dyes but discloses clearly enough the use of certain dyes in conjunction with water-soluble organic compounds which have a solvent or softening action on the cellulose acetate and on the dyestuff as well. Ellis also discloses the thorough washing off and drying of the goods after the dye treatment.

Paine et al. disclose the dyeing of cellulosic material and wool with fluorescent dyes from the usual dye bath containing acetic acid. Although the fluorescent dyes are not stated to be daylight fluorescent, the patentees do disclose the step of washing the fabric in water after dyeing and then drying.

The remaining reference to be considered is the French patent to Rivat which was cited to disclose and apparently does disclose that it is old to wash cellulose acetate, after being dyed in a swelling bath, with large amounts of cool water. This reference states that solvents for cellulose acetate are also swelling agents for this material.

The Examiner has held all of the claims unpatentable over the French patent to Rhodiaseta. As pointed out above, this reference is particularly concerned with certain materials which may in aqueous solution be substituted for aqueous alcoholic solutions in the dyeing of cellulose acetate. It thus appears that aqueous alcohol baths are disclosed by reference in this patent and it is therefore the Examiner's position that it would not be inventive to use aqueous alcohol as the swelling agent in the process of this French patent since it is one of the older and better known swelling agents referred to in this same patent. With regard to the subsequent washing step employed by the appellants here, the French patent under consideration does not show a washing step except in Example II, but in this example the washing step precedes the dyeing step and such a procedure would obviously not meet the terms of the appealed claims. However, the Examiner calls attention to the patents to Paine et al., Rivat and Ellis, each of which clearly discloses the washing of acetate fabrics after being dyed in a dye bath containing alcohol and similar materials which have a swelling action on cellulose acetate.

The Examiner discusses an affidavit which was filed to overcome the rejection on this reference, but he considers the affidavit unconvincing for certain reasons which are given on pages 10 and 11 of his Statement. We, too, have considered the affidavit, but we are not convinced that the claims here on appeal define a process which is patentably novel over the state of the art referred to in this rejection and discussed above.

With regard to the use of daylight fluorescent dyes we consider this a matter of choice since the selection of a known dye for a particular purpose or for a particular effect desired to be produced is not considered to be patentable. Ellis and the other secondary references clearly disclose the idea of flushing the fabric after dyeing and the use of alcohol in a dye bath in an amount sufficient to swell the fibers is shown by Ellis and others. Rivat states that rinsing is necessary in view of the swelling function of the alcohol and water and it is clear from this reference and others that temperatures high enough to injure or destroy the fabric must be avoided. Appellants admit that they were not the first to use daylight fluorescent dyes and they are not the first to discover that fluorescent dyes when used in concentrations above a certain limit lose their fluorescence. This much was recognized by Paine et al. who state that the dye they use gives a maximum fluorescent effect at about 0.1% where fluorescence disappears when as much as 5% is used. While it may be necessary in carrying out appellants' process to so proceed that the filaments do not coalesce, it appears that the prior art was also concerned with the prevention of coalescence and other undesired effect when using strong aqueous alcoholic solution of dyes. The Imperial patent took precautions not to damage the material by controlling the temperature.

After considering all of the facts presented in this case we are of the opinion that the Examiner reached the correct conclusion with regard to the rejection under consideration and it will therefore be sustained.

A second rejection of the claims involves the Rhodiaseta patent discussed above and the British patent to Abel. In this rejection the Examiner takes the direct position that it would not amount to invention to use Abel's alcohol solution as the swelling agent in the French process since both patents refer to the use of the same dyestuffs, namely, basic dyestuffs to which class all of the dyes shown by appellants belong. This rejection is further based on a proposition that since the French patent itself mentions the prior use of alcohol for which the materials therein disclosed are substitutes, the use of the alcohol bath of Abel would lack invention. We likewise consider this rejection proper and it will be sustained.

The remaining rejection to be considered involves the British Imperial patent which discloses the use of appellants' dye bath to dye cellulose acetate film and also discloses Rhodamine B along with other dyes such as those disclosed in some of the other references. This patent does not disclose the flushing of the fabric after dyeing, but since this step is conventional with Rivat and Ellis, the Examiner sees no invention in this particular step. We also agree with this ground of rejection.

Certain limitations in some of the claims have been referred to in detail in the Examiner's Statement and we adopt the Examiner's reasoning with regard thereto. The expression used in certain of the composition claims regarding the arrangement and orientation of the dye in the filaments of the fabric is at best indefinite and functional in its nature and does not add anything in the way of clarity to the definition of the composition claimed.

In reaching the above conclusion we have given careful consideration to appellants' remarks and arguments presented in the brief as well as the various affidavits submitted in this case, but it appears to us that the dyeing of cellulose acetate in a bath and under the conditions defined in the appealed claims is not new with the appellants here nor is it new to dye cellulose acetate in such a bath by using a daylight fluorescent dye as disclosed in the British Imperial patent. The washing step appears to be an expedient which is also old in this art in the dyeing of cellulose acetate and would be an obvious procedure for the purpose of flushing dye from the surface of the filaments of the fabric.

Claims 9 and 13 have also been rejected as drawn to nonelected species. The rejection has not been controverted and in the absence of an allowable generic claim appears to be proper.

The decision of the Examiner is affirmed.

In event of appeal attention is directed to *In re* Boyce, 32 CCPA, 718; 144 Fed. (2d), 896; 1944 C. D., 609; 568 O. G., 568; 63 USPQ, 80, in regard to specifically including in the appeal notice all grounds of rejection in the Examiner's Statement not expressly overruled by the Board.

E. F. KLINGE,
Examiner-in-Chief,
E. W. GENIESSE,
Examiner-in-Chief,
WARREN H. WILLNER,
Examiner-in-Chief,
(Acting)
Board of Appeals.

August 11, 1948

Messrs. Ely & Frye,
919 National City Bldg.,
Cleveland 14, Ohio.

IN THE UNITED STATES PATENT OFFICE

Appeal No. 13,962

BEFORE THE BOARD OF APPEALS

Ex parte Joseph L. Switzer and Richard A. Ward

Application for Patent filed February 13, 1942, Serial No. 430,792. Fluorescent Textiles

Messrs. Ely & Frye for applicants.

ON PETITION FOR RECONSIDERATION

Appellants have filed a petition for rehearing which will be treated as a petition for reconsideration.

Petitioners seem to be of the opinion that this Board made a new ground of rejection in holding the terms "solvated" and "a state akin to solution" functional and indefinite. Apparently reference is had to the penultimate paragraph of page 9 of the decision, but there we are clearly referring to the arrangement and orientation of the dye as defined in composition claims 11 to 15, inclusive, as is apparent from a reading of the decision. These claims do not mention the "state" in which the dye is held in the fabric. The Examiner stated on the last page of his Statement that there is nothing in either the claims or the specification to suggest that some condition other than swelling is necessary to obtain such orientation. Petitioners' argument to the effect that the Examiner's "reasoning" as to the solvated state of the dye is based on art published after the filing date of this application is beside the point because, if this condition of the dye in the fabric is the result of swelling the fabric to receive the dye, the art discussed in our decision amply teaches, in our opinion, dyeing of cellulose acetate filaments in a bath under the conditions claimed and it is admittedly not new with appellants to dye acetate filaments with daylight fluorescent dyes.

Apparently because we did not agree with appellants' position regarding the patentability of the claims the assumption is made that the board gave no consideration to the brief and the several affidavits of record. Such an assumption is wholly speculative and without foundation. We consider it unnecessary to give detailed reasons why we are not convinced by the affidavit of Joseph L. Switzer. It is sufficient to state that the reasons for refusing the claims are amply set forth by both the Examiner in his Statement and by the Board in its decision. Whatever the conditions necessary to produce appellants' effect, to the extent that they are defined in the appealed claims, we consider them substantially anticipated by the prior art and no reason is apparent for changing the conclusion reached. The affidavits of record have not convinced us to the contrary.

The petition has been considered but is denied in respect to making any change in our decision.

E. F. KLINGE,
Examiner-in-Chief,
E. W. GENIESSE,
Examiner-in-Chief,
WARREN H. WILLNER,
Examiner-in-Chief,
(Acting)
Board of Appeals.

October 4, 1948.

* * * * * * *

No. 1939 A.D. 1906

Date of Application, 25th Jan., 1906

Complete Specification Left, 16th July, 1906—
Accepted, 15th Nov., 1906

PROVISIONAL SPECIFICATION

"Process for Dyeing Acetylated Cellulose or Artifical Silk made therefrom."

I, Charles Denton Abel, of Birkbeck Bank Chambers, Southampton Buildings, in the County of London, Consulting Engineer and Chartered Patent Agent, do hereby declare the nature of this invention (as communicated to me from abroad by Actien-Gesellschaft für Anilin-Fabrikation, of Berlin, in the Empire of Germany, Chemical Manufacturers,) to be as follows:—

It is a well-known fact that acetylated cellulose or artificial silk made therefrom, has not been applicable for many kinds of manufacture because hitherto it could not be dyed.

Now my foreign correspondents have found a process for dyeing artificial silk made from acetylated cellulose, and according to this invention, this material may be dyed by means of organic colouring matters from a solution containing such a dyestuff, water and another suitable solvent, dark tints of any colour being obtainable; the dyeing process may be generally carried out in the usual manner and at ordinary temperature or at higher temperatures.

This result is very surprising in view of the following facts. For instance, from an aqueous solution of methylene-blue, artificial silk from acetylated cellulose cannot be dyed at all; moreover from an alcoholic solution this colouring matter produces on this silk only very feeble tints, whereas from a dye-bath containing this dyestuff, water and ethyl alcohol deep-blue tints are obtained. This typical result occurs also with many other dyestuffs as for instance with rhodamine, erica, chrysoidine, naphthol-yellow and magenta ,fuchsine). As second solvent, besides water, may be also mentioned by way of example, methyl alcohol, acetone, acetic acid or the like; from such mixtures by means of a suitable organic dyestuff deep tints can be obtained, whereas a solution of such a dyestuff in water alone or in the second solvent alone gives no good results.

Dated this 25th day of January 1906.

ABEL & IMRAY,
Agents for the Applicant.

COMPLETE SPECIFICATION

"Process for Dyeing Acetylated Cellulose or Artificial Silk made therefrom."

I, Charles Denton Abel, of Birkbeck Bank Chambers, Southampton Buildings, in the County of London, Consulting Engineer and Chartered Patent Agent, do hereby declare the nature of this invention (as communicated to me from abroad by Actien-Gesellschaft fur Anilin-Fabrikation, of Berlin, in the Empire of Germany, Chemical Manufacturers,) and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

It is a well-known fact that acetylated cellulose or artificial silk made therefrom, has not been applicable for many kinds of manufacture because hitherto it could not be dyed.

Now my foreign correspondents have found a process for dyeing artificial silk made from acetylated cellulose, and according to this invention, this material may be dyed by means of organic colouring matters from a solution containing such a dye-stuff, water and another suitable solvent, dark tints of any colour being obtainable; the dyeing process may be generally carried out in the usual manner and at ordinary temperature or at higher temperatures.

This result is very surprising in view of the following facts. For instance, from an aqueous solution of methylene-blue, artificial silk from acetylated, cellulose cannot be dyed at all, moreover, from an alcoholic solution this colouring matter produces on this silk only very feeble tints, whereas from a dye-bath containing this dye-stuff, water and ethyl alcohol deep blue tints are obtained. This typical result occurs also with many other dye-stuffs as for instance with rhodamine, erica, chrysoidine, naphthol-yellow and magenta (fuchsine). As second solvent, besides water, may be also mentioned by way of example, methyl alcohol, acetone, acetic acid or the like; from such mixtures by means of a suitable organic dye-stuff deep tints can be obtained, whereas a solution of such a dyestuff in water alone or in the second solvent alone gives no good results.

The following examples illustrate our invention, the parts being by weight:

1. 2 parts of methylene-blue (a basic dyestuff) are dissolved in a mixture of 200 parts of water and 150 parts of alcohol; this solution forms the dye-bath in which 10 parts of acetylated cellulose are treated at ordinary temperature during about a quarter of an hour.

In this manner a deep blue tint is obtained whereas from an alcoholic or aqueous solution of the same concentration and within the same time only very feeble tints are obtained. Instead of the ethyl alcohol employed above the same proportion of methyl alcohol may be used.

2. 2 parts of magenta (a basic dyestuff) are dissolved in a mixture of 500 parts of water and 500 parts of glacial acetic acid; in this solution are dyed 20 parts of acetylated cellulose at ordinary temperature during about 20 minutes. In this way there is obtained a deep blue red tint whereas from an aqueous solution of magenta acetylated cellulose cannot be dyed at all.

3. There is prepared a solution of 10 parts of naphthol-yellow S (an acid-dyestuff) in a mixture of 500 parts of water and 500 parts of alcohol. Into this dye-bath 20 parts of acetylated cellulose are introduced at 70°C and at this temperature treated for about one hour, after which the material is washed in warm water, pressed and dried at a temperature of 80 to 100°C. In this manner a fine yellow colour is produced.

4. 10 parts of erica B (a substantive cotton dyestuff) are dissolved in a mixture of 500 parts of water and 500 parts of ethyl alcohol (for which may be substituted 500 parts of methyl alcohol.) In this dye-bath 20 parts of acetylated cellulose are treated at ordinary temperature, a deep red tint being obtained, whereas from an aqueous or alcoholic solution of this dye-stuff acetylated cellulose cannot be dyed at all.

5. 10 parts of ponceau 4 GB (an acid azo-dye-stuff) are dissolved in a mixture of 500 parts of alcohol and 500 parts of water. With this solution are treated 20 parts of acetylated cellulose at ordinary temperature during about a quarter of an hour, a deep orange-yellow

tint being obtained, whereas under the same conditions from an aqueous solution or from an alcoholic solution at a raised temperature the acetylated cellulose remains nearly colourless.

6. In a dye-bath prepared from 500 parts of water and 500 parts of acetone by dissolving therein 4 parts of chrysoidine (a basic dyestuff) are treated 20 parts of acetylated cellulose at ordinary temperature and during about a quarter of an hour. In this way a deep orange tint with a cast of brown is obtained.

Of course the present invention is not limited to the foregoing examples nor to the details given therein. Obviously numerous alterations as to the special conditions in which our new process of dyeing is to be carried out, must be made according to the nature of the particular sample of acetylated cellulose, as the different kinds of acetylated cellulose, obtained according to the different processes, may possess a somewhat different affinity for organic dyestuffs. Thus it is impossible to give such directions as to render experiment entirely unnecessary, some trials must be made to find the best proportion of the two solvents which are to be combined to form the dye-bath, the best temperature *etc.* Naturally, the depth of the tint to be obtained has a great influence upon the proportion of the dye-stuff to be dissolved in the dye-bath, the duration of the dyeing process *etc.* Furthermore as second solvent any suitable solvent may be used which can be mixed with water to form a homogeneous solution, provided that the dye-stuff to be used is soluble in such a mixture of the two liquids.

It is also, impossible, of course to give an exhaustive category of the dyestuffs which are suitable for dyeing acetylated cellulose according to the process. As will be seen from the foregoing examples dye-stuffs belonging to most of the known classes are available, and generally speaking only mordant dye-stuffs are not available.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed I declare that what I claim is:—

The herein described process for dyeing acetylated cellulose or artificial silk made therefrom by means of organic dye-stuffs, which process consists in dyeing either in the cold or at a raised temperature in a solution containing water, a suitable second solvent and a suitable dye-stuff.

Dated this 16th day of July 1906.

ABEL & IMRAY,
Agents for the Applicant.

* * * * * * *

Translation of French patent no. 847107, gr. 14, cl. 1, to GEORGES RIVAT residing in France (Rhone), applied for June 10, 1938, granted June 26, 1939, published Oct. 3, 1939. Improvements in the dyeing or printing of cellulose ethers or esters or their derivatives.

It is known that the fixation of vat dyes on materials having a cellulose ether or ester base or their derivatives and more specially on textile materials such as acetate rayon gives rise to considerable difficulties whether it is a question of dyeing properly speaking, printing or other operations of general or local dyeing. This fixation requires, indeed, that the dyestuff penetrate the materials to be dyed which is opposed by the impermeability of these materials; it requires, furthermore, that we work in quite strongly alkaline medium which is difficult in particular because of the risk of saponifying more or less completely the ethers or esters, that is to say, modifying unfavorably the material to be dyed. For all these reasons the fixation of vat dyes on these materials and more particularly on artificial textiles having a cellulose acetate base have given hitherto only poor or mediocre results.

The present invention permits on the contrary fixing vat dyes on the materials in question in a perfect manner, in particular with a good penetration, without the use of any alkaline compound capable of causing even a partial saponification and operating at low temperature. The process which forms the object thereof consists essentially in effecting the fixation and the reduction of the dyestuff in an aqueous medium containing in solution a considerable proportion of an agent dissolving or swelling up the cellulosic material to be dyed.

The proportion of dissolving or swelling agent to be used varies according to the nature of the said agent and that of the materials to be dyed. We can fix it in general between 15 and 35% by weight of the final medium. It goes without saying that it is necessary to use an agent quite soluble in water in order to permit obtaining a solution at the proper concentration.

In this special case of textile materials having a cellulose acetate base we may use methyl alcohol and its higher homologues, acetone and the higher ketones, ethyl lactate, this enumeration being, however, in no way restrictive.

The fixation and the reduction may be carried out in one and the same phase, the dyestuff being dispersed in the aqueous medium to which we add sodium hydrosulfite as reducing substance and the materials to be dyed being treated with the bath thus obtained. However, we may also operate in two phases, the materials being first treated with a first aqueous medium in which the dyestuff is dispersed but which does not contain sodium hydrosulfite or equivalent, either medium having to contain the dissolving or swelling agent as set forth above.

It is possible to verify by experiments that in the second method of operation the particles of insoluble dyestuff are adsorbed by the artificial fibers during the first phase outside of any process of reduction and that the dyestuff thus adsorbed is then reduced during the second phase in the very interior of the fibers, this penetration of the particles and of the reducing bath being rendered possible by the state of partial gel in which are found the materials treated because of the presence of the dissolving or swelling agent.

If in the first method of operation we allow the reduction of the dyestuff to take place before treating the materials in such a way that no more insoluble dyestuff will remain in suspension when the treatment is effected (of which fact we can assure ourselves by a filtration) it will be noted that the fibers will fix the reduced dyestuff and will become dyed in a satisfactory manner. In practice, the treatment of the materials to be dyed is effected without waiting for the reduction to be realized completely or even partially and the fibers will be dyed at the same time by adsorption of the insoluble dyestuff and reduction within the material and by direct fixation of the reduced dyestuff.

Whatever may be the mode of operation employed the treatment requires in general 15 to 30 minutes in the case of artificial textiles having an acetate base and the temperature does not need to exceed 25° C.

After this treatment the materials should be abundantly washed in cold water so as to eliminate the dissolving or swelling agent and to bring to an end the state of partial gel in which they were present. After which we proceed with the reoxidation in the usual manner by means of a hot soapy bath containing oxygenated water or an equivalent substance.

The dyestuffs thus fixed on the artificial acetate textiles have the same properties of solidity, regularity and depth of coloring as in the case of viscose.

It is to be noted that the process according to the invention is not suited, however, for all vat dyes. Good results are obtained in particular with indigo, thioindigo, indol-naphthalene indigo, indol-anthracene indigo, bisthionaphthene indigo, acylaminoanthraquinone, anthraquinonazine, this list being, furthermore, in no way restrictive. On the other hand, the simple and non-amino-substituted benzathrones (violanthrone, Blue Ciba 3 G, etc.) give much less satisfactory results.

The examples hereinafter will permit the invention to be better understood, its characteristics as well as the advantages which it permits us to realize.

Example 1.—We prepare a solution of acetone in water with 20% acetone by volume and in 1000 cubic centimeters of this solution at 20° C. We disperse 2 grams of Green Ciba G (dichloro-2-2′-thionaphthene indigo no. 1259 of Schultz) then we add 5 grams of sodium hydrosulfite. We agitate for some minutes and immerse in the bath thus obtained a piece of acetate rayon agitating it therein and that for 15 to 30 minutes approximately. Then we wash it thoroughly in cold running water, then we soap it hot (60 to 70° C.) with water containing to the liter 2 grams of soap and 0.5 cubic centimeters of oxygenated water to make 100 volumes. Then we rinse with fresh water at 40° C.

Example 2.—In 1000 cubic centimeters of a solution of ethyl lactate in water, 25% of lactate by volume, carefully neutralized if necessary to eliminate any trace of free acid we disperse 3 grams of Ciba blue 2 B (5-7-5′-7′ tetrabromoindigo no. 1314 of Schultz). In this bath at 20° C. we agitate a piece of acetate rayon for about 20 minutes. Then, without washing it, we transport this piece into another cold aqueous solution of ethyl lactate, likewise 20% by volume, and likewise neutralized if need be, in which we have dissolved 0.5 grams of sodium hydrosulfite. We agitate it again for 20 minutes, then wash it with cold running water, soap it in oxygenated water and lastly rinse as in the first example.

Example 3.—We put in suspension 4 grams of gray Ciba as a fine powder (5-bromo-2-indol-2′-thionaphthene indigo, no. 1355 of Schultz) in 1000 cubic centimeters of an aqueous solution, 30% by volume, of propyl alcohol at 15 to 20° C., then we add 8 grams of sodium hydrosulfite. After stirring for some minutes we immerse therein a piece of acetate rayon, stirring further. At the end of 30 minutes we remove it, wash it, soap it and rinse it as above.

Example 4.—We put in suspension 3 grams of Bordeaux indanthrene B doubly fine paste (2-2′ anthraquinonyl—1-5—diamino anthraquinone no. 1277 of Schultz) in 1000 cubic centimeters of an aqueous solution of propyl alcohol, 25% by volume, at 20 to 25° C, then we add thereto 5 grams of sodium hydrosulfite and treat a piece of acetate as in the preceding example.

Example 5.—we prepare a printing paste for acetate textiles in the following manner:

Ethyl lactate: 350 cubic centimeters;
Blue Ciba 2 B: 20 grams;
Triethanolamine: 20 grams;
Water: 170 grams;
Sodium hydrosulfite: 40 grams;
Colorezine, 60 grams to the liter: 400 grams.

The textile fabric, after printing, is dried, washed at 40° C., then soaped at 70° C. with a water containing 2 grams of soap and 0.5 cubic centimeters of oxygenated water per liter. The dye stuff is thus fixed without vaporizing.

Among the vat dyes utilizable for the application of the process according to the invention we may mention, not restrictively, the following:

Red Ciba B (dichloro—2-2′ bis—thionaphthene indigo);

Green Ciba G (1-2-5-6 anthraquinone diphenacridone);

Violet Ciba 6 R (5-7-dibromo-2—thionaphthene indigo);

Scarlet Ciba G (5-7-dibromo-3-indol-2-thionaphthene indigo);

Yellow Orange indanthrene G (1-2-4-pyranthrone);

Green Cibanone G C (2 indol-2′-anthracene-2-thionaphthene indigo);

Scarlet algool GGR (5-5′-dibromo-6-6′-diethoxy-2′-2′bis thionaphthene indigo);

Bordeaux indanthrene B (2-2′ anthraquinonyl 1-5-diaminoanthraquinone);

Blue Cibanone B V (no. 1277 of Schultz, derived from 1-aminomethylanthraquinone).

It goes without saying that the examples above mentioned are only given by way of illustration. The process forming the object of the invention may be applied in any suitable manner and not only by printing or dyeing.

Lastly, and as is self evident, the invention embraces in addition, and that by way of new industrial products, textile or other materials, having a base of cellulose ethers or esters dyed with vat dyes by application of the process mentioned above as well as articles manufactured from such materials.

Resumé

Process for coloring with the aid of vat dyes by dyeing, printing or otherwise materials having a base of cellulose ethers or esters or their derivatives and more particularly artificial textile materials having a base of cellulose acetate or the like, consisting in fixing and reducing the dye in an aqueous medium containing in solution a considerable proportion of a dissolving or swelling agent, dissolving or swelling the cellulosic material to be dyed, the said process being capable, furthermore, of embracing the other characteristics hereinafter set forth taken separately or in combination:

1. The operation is in two phases, the materials being first treated by a first aqueous medium containing the dyestuff in suspension but without the reducing agent, then with a second aqueous medium containing a reducing agent but without dyeing agent.

2. It is likewise possible to operate in a single phase, the materials to be dyed being treated by an aqueous medium containing both the dyestuff dispersed and the reducing substance, the operation being capable of being carried out during or even after the carrying out of the reaction of reducing the dispersed dyestuff.

3. We wash abundantly with running water after the treatment before proceeding with the reoxidation in the usual manner.

4. As dissolving or swelling agents we use in the case of acetate methyl alcohol or its higher homologues, acetone or the higher ketones, ethyl lactate, etc.

* * * * * * *

DEFENDANT'S EXHIBIT 2

Filed April 4, 1951, Harry M. Hull, Clerk.

Patented Aug. 7, 1934 1,968,819

UNITED STATES PATENT OFFICE

1,968,819

Dyeing of Textile Materials

Camille Dreyfus, New York, N. Y.

No Drawing. Application February 20, 1931,
Serial No. 517,308

13 Claims. (Cl. 8—5)

This invention relates to the dyeing of textile materials containing cellulose acetate or other organic derivative of cellulose, and relates more particularly to the provision of a method whereby fabrics containing cellulose acetate yarn may be dyed by a padding or other inexpensive method.

An object of my invention is to dye textile materials comprising cellulose acetate or other organic derivative of cellulose by an economical method involving padding. A further object of my invention is to dye cellulose acetate or other organic derivative of cellulose fabric by padding the fabric in the presence of a suitable material that has at least a softening action on the organic derivative of cellulose with a dyestuff that has little or no affinity for cellulose acetate or other organic derivative of cellulose material when applied in the ordinary manner. Other objects of this invention will appear from the following detailed description.

The padding method is one of the least expensive methods of dyeing fabrics and therefore its use is highly desirable from the point of view of economy. However heretofore it has not been possible to obtain satisfactory colorations on fabrics containing cellulose acetate material by a padding method, due to the fact, among other reasons, that the cellulose acetate material is not sufficiently absorbent to take up enough of the ordinary dye liquor to obtain the required depth and brilliancy of color.

I have found that if there is present in the dye bath a relatively large amount of volatile organic liquid of relatively high boiling point which has at least a softening action on the organic derivative of cellulose such dyebath may be applied to fabric containing organic derivative of cellulose yarn by a padding or analogous method, and after suitable fixation of the dyestuff, very satisfactory colorations are obtained. Moreover, by this process, many dyestuffs that have little or no affinity for the organic derivative of cellulose when applied by ordinary dyeing methods may be employed to obtain brilliant colors which are quite fast to soaping, rubbing, etc. This method presents many economies which are due not only to the low cost of manipulation involved in a padding method as compared with dyeing in jigs, winches, dye barks or the like, but also to the fact that dyestuffs of low cost may be used and the amount of dyestuff necessary to produce a given depth of color is considerably reduced.

In accordance with my invention, I dye or color fabrics containing organic derivatives of cellulose by applying thereto, preferably by a padding method, a dye liquor containing a suitable dyestuff and a volatile organic liquid having a boiling point above 100° C. and that has at least a softening action on the organic derivative of cellulose.

The textile material to be treated may be in the form of a fabric containing yarn of organic derivatives of cellulose or cellulose ethers. Examples of such organic derivatives of cellulose are cellulose acetate, cellulose formate, cellulose propionate and cellulose butyrate, while examples of cellulose ethers are ethyl cellulose, methyl cellulose and benzyl cellulose. The fabric may be a mixed fabric containing yarns of organic derivatives of cellulose and yarns of other fibres such as cotton, reconstituted cellulose, natural silk, wool, etc. Some of the dyestuffs that may be used have no affinity for the said other materials, and thus differential color effects may be obtained.

As stated, the dye liquor that is applied to the fabric contains a volatile organic liquid which has a relatively high boiling point, preferably above 100° C., and which is a solvent for or acts to soften the organic derivative of cellulose. While I prefer to employ ethyl lactate, other suitable organic liquids may be used examples of which are the acetate of mono ethyl ether or ethylene glycol, diacetone alcohol, benzyl alcohol, tetrachlorethane, etc. I prefer to employ organic liquids that are miscible with water. The amount of organic liquid used in the dye liquor will vary with the particular organic liquid employed, in the case of ethyl lactate the amount being from 160 to 400 cc. or more per litre of dye liquor.

Various kinds of dyestuff may be employed and they may be basic dyes, certain vat dyes, water insoluble coloring bodies which are ordinarily applied to cellulose acetate in a form dispersed or solubilized by means of soaps, fatty acids, etc. It is a surprising fact that by this invention some direct cotton dyes which have no affinity for cellulose acetate material when applied by other methods may be used. Also certain of the acid dyes which have no affinity for cellulose acetate material produce excellent dyeings when employed in this invention. The amount of dyestuff present in the dye liquor will vary in accordance with the particular dyestuff employed and the depth of color desired, the amount required being less than in ordinary dye methods and being as low as 0.5 to 3% of the dyebath.

The dye liquor may be applied to the fabric by any suitable padding mangle. Thus the fabric may be passed between two rolls, the lower one of which dips in the dye liquor. If desired the fabric may be passed continuously through the dye liquor and then between rolls. The nip of the rolls is regulated so that the required amount of dye liquor is retained by the fabric to obtain the desired depth of color. If desired a small amount of thickening agent such as gum arabic, gum tragacanth or Colloresin (water soluble methyl cellulose) may be added to the dye liquor, and the material applied to the fabric by means of pin rolls or all-over rolls.

After application of the dye liquor, the fabric may be batched and then dried or it may be directly given a simple drying at temperatures below 100° C., say 60 to 90° C. by passing the fabric through chambers containing heated air, or over heated drums or cans. To obtain maximum fastness to soaping and for most successful results, it is important that the ethyl lactate or other volatile organic liquid employed should be completely removed by the drying process. The fabric may then be rinsed or given any other suitable after treatment.

In order further to illustrate my invention, the following specific example is given.

Example

A fabric consisting of cellulose acetate yarn is padded with a dye liquor of the following composition:

	Parts by weight
Dyestuff	0.5 to 2
Ethyl lactate	300 to 400
Water	700 to 400

The dyestuff used may be any one or more of the following: Milling green (color index No. 667); chloramine black J (Sandoz) (color index No. 581); acridine red (color index No. 740); chromazurine H. B. (color index No. 879); palatin orange: palatin black (color index No. 241); banzyl violet (color index No. 683); cyanol blue; milling orange (color index No. 274); metanile yellow (color index No. 138); chomacetine blue S. (color index No. 884); acid blue N. V. S.; acridine orange (color index No. 788); astra violet; alkalin blue (color index No. 704); rhoduline blue (color index No. 658); orange II (color index No. 151); neolane orange; chrysophenine (color index No. 365); rhoduline yellow 6 G. (color index No. 815); milling red (color index No. 344); induline (color index No. 861); acridine red P. S. (color index No. 740); induline brown; polar red (color index No. 430); benzyl green (color index No. 667); wool blue acid N; formyl violet 5 B. (color index No. 698) and rhodamine 3 G. O. (color index No. 749).

The nip of the roll is arranged so that an amount of dye liquor to obtain the desired depth of color is taken up by the fabric. The fabric is then dried at 70 to 80° C. for sufficient time to cause complete vaporization of the ethyl lactate. The fabric is then rinsed and then may be scoured or given any other desired treatment.

The colorations obtained are quite brilliant and are of great depth for the amount of dyestuff employed. Moreover the color is surprisingly fast to soaping.

The term "mechanical impregnation" as used hereinafter in the claims connotes any method of applying a reagent in which, as opposed to a bath treatment process, the whole quantity of reagent is applied to the goods in such an amount of vehicle as can be completely retained by the said goods.

The foregoing detailed description is given merely by way of illustration and many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. Method of coloring textile materials containing organic derivatives of cellulose comprising applying to the whole surface thereof, by mechanical impregnation, a dye liquor containing a volatile liquid that has at least a softening action on the organic derivative of cellulose and a dyestuff that has relatively little or no affinity for the organic derivative of cellulose when applied in simple dyebaths, and then drying.

2. Method of coloring textile materials containing cellulose acetate comprising applying to the whole surface thereof, by mechanical impregnation, a dye liquor containing a volatile liquid that has at least a softening action on the cellulose acetate and a dyestuff that has relatively little or no affinity for the cellulose acetate when applied in simple dyebaths, and then drying.

3. Method of coloring textile materials containing organic derivatives of cellulose comprising applying to the whole surface thereof, by mechanical impregnation, a dye liquor containing a volatile liquid of a boiling point above 100° C. that has at least a softening action on the organic derivative of cellulose and a dyestuff that has relatively little or no affinity for the organic derivative of cellulose when applied in simple dyebaths, and then drying.

4. Method of coloring textile materials containing cellulose acetate comprising applying to the whole surface thereof, by mechanical impregnation, a dye liquor containing a volatile liquid of a boiling point above 100° C. that has at least a softening action on the cellu-

lose acetate and a dyestuff that has relatively little or no affinity for the cellulose acetate when applied in simple dyebaths, and then drying.

5. Method of coloring textile materials containing cellulose acetate comprising applying to the whole surface thereof, by mechanical impregnation, a dye liquor containing ethyl lactate and a dyestuff that has relatively little or no affinity for the cellulose acetate when applied in simple dyebaths and then drying.

6. Method of coloring fabric containig organic derivative of cellulose yarn comprising padding the fabric with a dye liquor containing a suitable dyestuff and a volatile liquid having a boiling point above 100° C. that has at least a softening action on the organic derivative of cellulose and then drying the fabric.

7. Method of coloring fabric containing cellulose acetate yarn comprising padding the fabric with a dye liquor containing a suitable dyestuff and a volatile liquid having a boiling point above 100° C. that has at least a softening action on the cellulose acetate and then drying the fabric.

8. Method of coloring fabric containing cellulose acetate yarn comprising padding the fabric with a dye liquor containing a suitable dyestuff and a volatile liquid having a boiling point above 100° C. that has at least a softening action on the cellulose acetate and then drying the fabric at a temperature below 100° C.

9. Method of coloring fabric containing organic derivative of cellulose yarn comprising padding the fabric with a dye liquor containing a suitable dyestuff which has little or substantially no affinity for the organic de-

rivative of cellulose when applied in simple dyebaths and a large amount of a volatile liquid having a boiling point above 100° C. that has at least a softening action on the organic derivative of cellulose, and then drying the fabric.

10. Method of coloring fabric containing cellulose acetate yarn comprising padding the fabric with a dye liquor containing a suitable dyestuff which has little or substantially no affinity for the cellulose acetate when applied in simple dyebaths and a large amount of a volatile liquid having a boiling point above 100° C. that has at least a softening action on the cellulose acetate, and then drying the fabric.

11. Method of coloring fabric containing cellulose acetate yarn comprising padding the fabric with a dye liquor containing ethyl lactate and a suitable dyestuff and then drying the fabric.

12. Method of coloring fabric containing cellulose acetate yarn comprising padding the fabric with a dye liquor containing ethyl lactate and a suitable dyestuff that has substantially no affinity for the cellulose acetate when applied in simple dyebaths and then drying the fabric.

13. Method of coloring fabric containing cellulose acetate yarn comprising padding the fabric with a dye liquor containing ethyl lactate and a suitable dyestuff that has substantially no affinity for the cellulose acetate when applied in simple dyebaths and then drying the fabric at a temperature below 100° C.

CAMILLE DREYFUS.

CERTIFICATE OF CORRECTION

Patent No. 1,968,819. August 7, 1934.

CAMILLE DREYFUS

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows. Page 1, line 84, for "or" read of; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of September, A. D. 1934.

LESLIE FRAZER,
[SEAL.] *Acting Commissioner of Patents.*

(Here follow 2 photostats, fols. 257 & 258.)

☆ U. S. GOVERNMENT PRINTING OFFICE: 1951 943168 780

Defendent's Exhibit 3

Society of Dyers and Colourists

COLOUR INDEX

Edited by

F. M. ROWE D.Sc., F.I.C.

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JUN 24 1930
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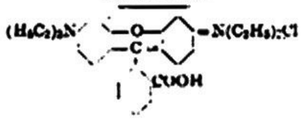
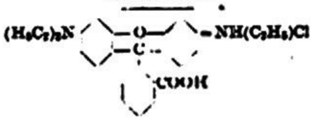
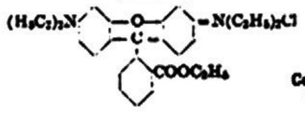
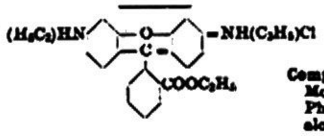
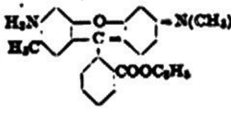
No.	*Commercial Name*	*Scientific Name—Components—Formula*	*Preparation*	*Discoverer—Literature*
749 (573)	***Rhodamine B** (CAC) (Gy); **B**, **B extra** (H) (DuP) (S) (SCI) (LJ) (S'D) (A) (B) (By) (C) (GrE) (K) (MLB); **B base** (DuP); **NB extra** (CN); **EB extra conc.** (JDC); **O** (MLB) **Fat Red A** (SCI) **Safraniline** (By) **Brilliant Pink B** (L) **Rosazeine B** (MLB) **Carthamine B** (tM) *Some brands of Jute Scarlet (various makers) are mixtures of Rhodamine B and Orange II (No. 151)	Hydrochloride of diethyl-*m*-amino-phenol-phthalein, or tetraethyldiamino-*o*-carboxy-phenyl-xanthenyl chloride **Components**— Diethyl-*m*-aminophenol and Phthalic anhydride (or Fluorescein chloride and Diethylamine) $C_{28}H_{31}N_2O_3Cl$  N.B. The corresponding methyl-derivative is not sufficiently soluble to be of value	(a) Fusion of diethyl-*m*-aminophenol with phthalic anhydride (b) Action of diethylamine on fluorescein chloride under pressure (E.P. 9600^{88}) 10 kg. of diethyl-*m*-aminophenol are heated with 12 kg. of phthalic anhydride at 170-175° C. for 4-5 hours until the melt becomes crystalline. The phthalate of the colouring matter is cooled, finely powdered, and digested for several hours with 10 kg. of 18% ammonia and 160 litres of water at the ordinary temperature. The colour-base is then extracted repeatedly with benzene, and is removed from the united benzene solution by extraction with hot dilute hydrochloric acid. The hydrochloride separates in small green crystals on cooling the aqueous solution (G.P. 44002)	(a) **Cérésole** 1887 Badische Co. E.P. 15374^{87}, U.S.P. 377349, 377350, F.P. 186697 198173, G.P. 44002 (b) **Homolka** and **Boedeker** 1888 Hoechst Farb. E.P. 9600^{88}, F.P. 192580, G.P. 48367, 54684 Weingartner, Chem. Zeit. 1887, 11, 1620; cf. J.S.D.C. 1888, 4. 3 Knecht, J.S.D.C. 1888, 4. 96; 1905, 21. 204 Bernthsen, Chem. Zeit. 1892, 16, 195 Manual 505
750 (572)	**Rhodamine G**, **G extra** (S) (SCI) (B) (K) (MLB) **Brilliant Pink G** (L) **Rosazeine G** (MLB) **Carthamine G** (tM)	Mainly triethyldiamino-*o*-carboxy-phenyl-xanthenyl chloride **Components**— **Rhodamine B** (No. 749) and Aniline hydrochloride $C_{26}H_{27}N_2O_3Cl$  	Heat equal weights of **Rhodamine B** and aniline hydrochloride at 185-190° C. for about 1½ hours	**Cérésole** 1891 Badische Co. E.P. 14723^{91}, U.S.P. 516588, 516589, F.P. 215700, G.P. 63325 Manual 506
751 (574)	**Rhodamine 2B** (SCI); **3B**, **3B extra** (SCI) (B) **Anisoline** (Mo)	Ethyl-ester of tetraethyldiamino-*o*-carboxy-phenyl-xanthenyl-chloride $C_{30}H_{35}N_2O_3Cl$  	(a) Esterification of **Rhodamine B** with ethyl chloride—(Monnet) (b) Esterification of **Rhodamine B** with ethyl alcohol and a mineral acid—(G.P. 71490)—or with ethyl alcohol at 160-170° C. under pressure—(G.P. 73451) **Components**— **Rhodamine B** (No. 749) and Ethyl chloride (or Ethyl alcohol)	**Monnet** 1891; E.P. 4677^{92}, U.S.P. 499927, F.P. 216407 Badische Co. E.P. 7298^{92}, F.P. 225341, G.P. 66238, 71490, 73451 Monnet, Bull. Soc. Chim. 1892, 7, 523; cf. J.S.D.C. 1892, 8, 169 Bernthsen, Chem. Zeit. 1892, 16, 195 J.S.D.C. 1893, 9. 14, 100 Manual 506
752 (571)	**Rhodyle 4G**, **4G conc.** (BDC) **Rhodamine 6G** (CAC) (H) (DuP) (Gy) (S) (SCI) (B) (C) (K) (MLB); **6G extra** (H) (DuP) (S) (SCI) (B) (C) (MLB) **Trianisoline** (Mo) **Brilliant Pink 5G** (L) **Safranoline 5G** (L) **Rosazeine 6G** (MLB)	Ethyl-ester of diethyldiamino-*o*-carboxy-phenyl-xanthenyl chloride $C_{28}H_{31}N_2O_3Cl$  	Condensation of monoethyl-*m*-aminophenol with phthalic anhydride and esterification of the product with ethyl alcohol and a mineral acid **Components**— Monoethyl-*m*-aminophenol and Phthalic anhydride; and Ethyl alcohol	**Bernthsen** 1892 **Schmid** and **Rey** 1892 Badische Co. E.P. 9633^{92}, U.S.P. 516584, F.P. 225341, G.P. 72573 73880 Bernthsen, Chem. Zeit. 1892, 16, 195 J.S.D.C. 1893, 9, 120 Manual 507
753 (576)	**Rhodamine 3G**, **3G extra** (SCI) (B) **Rhodine 3G** (SCI) **Irisamine G**, **G extra** (C)	Ethyl-ester of amino-methyl-dimethylamino-*o*-carboxy-phenyl-xanthenyl chloride $C_{25}H_{25}N_2O_3Cl$  	Condensation of dimethyl- (or diethyl-) amino-*m*-hydroxy-benzoyl-benzoic acid (obtained from dimethyl- (or diethyl-) *m*-aminophenol and phthalic anhydride) with *m*-amino-*p*-cresol (CH_3:NH_2:OH = 1:2:4) and ethylation of the product **Components**— Dimethyl- (or diethyl-) amino-*m*-hydroxybenzoyl-benzoic acid (from Dimethyl- (or diethyl-) *m*-aminophenol and Phthalic anhydride) and *m*-Amino-*p*-cresol; and Ethylate	**Müller** 1895 Chem. Fabr. Bindschedler, Basle E.P. 4965^{96}, U.S.P. 584119, F.P. 245503, G.P. 85931, 87068, G.P. appl. B16962, B17374; E.P. 12180^{97}, F.P. 266985, G.P. 96108 E.P. 26602^{01}, U.S.P. 695441, F.P. 317891, G.P. 132066 Manual 507

Description—Properties—Mode of Application	*Notes*
earance—green crystals or reddish-violet powder. ctrum in water—λ−555·0 and 517·0. er—bluish-red solution with a strong fluorescence when dilute. ohol—bluish-red solution with a strong fluorescence when dilute; latter disappears on heating, but returns on cooling. HCl to ueous solution—gradual separation of green crystals of the rochloride, soluble in excess with a scarlet-red colour. This ution becomes bluish-red on dilution with water. NaOH—small quantity produces little change in the cold; an excess on ling gives a rose-red flocculent precipitate, soluble in ether or zene to a colourless solution; an odour of dimethylamine is erved on heating with concentrated sodium hydroxide. H_2SO_4—owish-brown solution with a strong green fluorescence and evolun of hydrochloric acid, scarlet-red solution and then bluish-red ution on dilution. n wool and silk—from a neutral bath strongly fluorescent ish-red. l dyeing 1; relation to cotton 4; relation to silk 5. ness on wool—Rubbing 3; Light 3–4; Dry-steaming 1–2; bleeding 2; Stoving—alteration 1, bleeding 2; Potting 4; Wat 3–4; Soda (wool washing)—alteration 2, bleeding 4; Milling—ation 2, bleeding 3; Alkali—soda 1–2, lime 2. n cotton—mordanted with tannin and tartar emetic bluish-pink hout fluorescence, or oiled-cotton bluish-pink with fluorescence. ness on cotton—Rubbing 2; Ironing 2; Light 3–4; Alkali 2; ids—HCl 2–3, $C_2H_2O_4$ 1; Chlorine 2; Water 2; Washing 3–4; —alteration 3, bleeding 4; Soda Boil—alteration 5, bleeding 3; d Boil—alteration 2, bleeding 3; Acetic Acid Test—alteration 1, ding 2. d largely in dyeing paper.	
earance—glistening green crystals. ctrum in water—λ−554·1 and 516·8. er—reddish-violet solution with a vermilion fluorescence. ohol—reddish-violet solution with a vermilion fluorescence. HCl aqueous solution—yellow solution which becomes red on dilution h water. NaOH—unaltered cold, decolourised on heating with cipitation of the colour-base. H_2SO_4—pale yellow solution, red rescent solution on dilution. o wool and silk—from a neutral bath fluorescent red, yellower n Rhodamine B (No. 749). l-dyeing 1; relation to cotton 4; relation to silk 5. ness on wool—Rubbing 3; Light 3–4; Dry-steaming 1–2; bleeding 2; Stoving—alteration 1, bleeding 2; Potting 4; Wash- 3–4; Soda (wool washing)—alteration 2, bleeding 4; Milling—ration 2, bleeding 3; Alkali—soda 1–2, lime 1–2. o cotton—mordanted with tannin and tartar emetic red without rescence. ness on cotton—Rubbing 2; Ironing 2; Light 3–4; Alkali 2; ids—HCl 2–3, $C_2H_2O_4$ 1; Chlorine 4–3; Water 3; Washing 3–4; —alteration 3, bleeding 4; Soda Boil—alteration 5, bleeding 3; d Boil—alteration 2, bleeding 3; Acetic Acid Test—alteration 1, ding 3–2.	
earance—brownish-red bronzy powder. ctrum in water—λ−559·2 and 519·7. er—violet-red solution with a brownish-red fluorescence when very dilute solution. ohol—red solution with a vermilion fluorescence. HCl to aqueous ution—yellow solution, red solution on dilution with water. OH—unaltered in the cold, but hydrolysed on heating with cipitation of the colour-base of Rhodamine B. H_2SO_4—greenish-low solution, red solution on dilution. o—wool and cotton mordanted with tannin and tartar emetic , bluer than Rhodamine B (No. 749), silk red with a yellowish- fluorescence and unmordanted cotton reddish-violet. d mainly for dyeing silk.	
earance—vermilion, yellowish-brown or red powder. ctrum in water—λ−523·4 and 491·2. er—readily soluble with a scarlet-red colour and a greenish orescence. ohol—red solution with a yellow fluorescence. HCl to aqueous ution — red precipitate if concentrated or small [illegible] [illegible] when greatly diluted. NaOH—red precipitate of the our-base, soluble in benzene with a yellowish-brown fluorescence. H_2SO_4—yellow solution, red solution on dilution. o—silk, and cotton mordanted with tannin and tartar emetic, liant red to pink, yellower than Rhodamine G (No. 750), and ighted-silk pink with a marked yellow fluorescence. tton—Rubbing 2; Ironing 2–3; Light 3–4; Alkali 1–2; Acids—l 2, $C_2H_2O_4$ 1; Chlorine 3; Water 2; Washing 3; Milling—ration 2, bleeding 3–4; Soda Boil—alteration 3–2, bleeding 2–3; d Boil—alteration 2, bleeding 3; Acetic Acid Test—alteration 1, ding 1.	
earance—green crystalline powder. ctrum in water—λ−535·3 and 499·2. er—crimson-red solution with a brown fluorescence. ohol—scarlet-red solution with a green fluorescence. HCl to ueous solution—unaltered. NaOH—scarlet-red precipitate. H_2SO_4—yellow solution, red solution on dilution. o—wool and cotton mordanted with tannin and tartar emetic ght red, bluer and brighter than Rhodamine 6G (No. 752); d silk bright red with a bluish-red fluorescence.	

BRIEF FOR APPELLANT

United States Court of Appeals

DISTRICT OF COLUMBIA CIRCUIT

APPEAL NO. 10,985

John A. Marzall, Commissioner of Patents,
APPELLANT

v.

Joseph L. Switzer and Richard A. Ward, APPELLEES

APPEAL FROM THE JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

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Solicitor, United States Patent Office,
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J. SCHIMMEL,
Of Counsel.

United States Court of A
For the
District of Columbia Cir

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Joseph W. Stewa
CLERK

QUESTION PRESENTED

The question presented is whether the trial Court properly held the claims in issue patentable notwithstanding that

(1) the Court held that the references relied upon by appellant disclose the materials and process steps utilized by appellees; and

(2) the product claims utilize functional and indefinite language at the exact point of novelty.

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United States Court of Appeals

DISTRICT OF COLUMBIA CIRCUIT

APPEAL NO. 10,985

JOHN A. MARZALL, COMMISSIONER OF PATENTS,
APPELLANT

v.

JOSEPH L. SWITZER AND RICHARD A. WARD, APPELLEES

APPEAL FROM THE JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

BRIEF FOR THE COMMISSIONER OF PATENTS

JURISDICTIONAL STATEMENT

This is an appeal from the decree of the United States District Court for the District of Columbia Circuit (20)* in which defendant was authorized to issue to plaintiffs Letters Patent of the United States based upon plaintiffs' patent application Serial No. 430,792, filed February 13, 1942 and containing claims numbered 4 to 17, both inclusive.

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* Numbers in parentheses refer to pages in the Appellant's Appendix.

The action below was instituted by a complaint (2) brought under and pursuant to the provisions of Section 4915 of the Revised Statutes (35 U. S. C. sec. 63). This Court has jurisdiction with respect to appeals from the final decision of the District Court by virtue of Revised Title 28 of the United States Code (28 U. S. C. 1291).

The complaint is printed in full in the appendix (2), and the jurisdiction of the District Court is based upon these facts:—that the defendant, Commissioner of Patents, by decision of the Patent Office Board of Appeals, had refused all the claims in the aforementioned patent application, that no appeal from the decision of the Board of Appeals was taken to the United States Court of Customs and Patent Appeals, and that the action was brought in the District Court within six months from the date of the decision of the Board of Appeals.

The answer is printed in the appendix (10); it admits the allegations contained in paragraphs 1, 2, 3, 6 and 8, admits that plaintiffs' patent application was duly filed on February 13, 1942 and given Serial No. 430,792, admits that the Board of Appeals refused a patent upon said application, but denies that such refusal was incorrect and contrary to law. The answer specifically denies that plaintiffs were the true, original and first inventors of the subject matter claimed in said application (11) and asserts that the claims are unpatentable in view of certain prior patents specifically identified (11).

Defendant, Lawrence C. Kingsland named in the complaint, was succeeded as Commissioner of Patents by John A. Marzall during the pendency of the action in the District Court, and said Marzall was timely substituted, in his official capacity as party defendant (12).

STATEMENT OF THE CASE

1. PROCEEDINGS BELOW

Appellees, Joseph L. Switzer and Richard A. Ward, plaintiffs below, as joint applicants had filed in the Patent Office an application for patent on an alleged improvement for a "Fluorescent Textile", the application being filed on February 13, 1942, and being assigned Serial No. 430,792. This application was duly examined according to the rules of the Patent Office, and as a result of such examination, the examiner in charge thereof finally rejected all the claims in the case the reason for said rejection being that the claims were unpatentable over certain prior patents, namely:

Abel (Br.)	1,939	Nov. 15, 1906
Rhodiaseta (Fr.)	579,896	Aug. 16, 1924
Imperial (Br.)	412,952	July 5, 1934
Ellis	2,053,276	Sept. 8, 1936
Paine et al.	2,089,413	Aug. 10, 1937
Rivat (Fr.)	847,107	June 26, 1939

An appeal to the Patent Office Board of Appeals as provided by law, was filed by appellees within the required time. In accordance with the rules of the Patent Office, the examiner then issued a statement to the Board of Appeals setting forth his reasons and grounds for refusal. This statement appears at pp. 155-162 of the appellant's appendix. The Board of Appeals sustained the examiner's rejection in an opinion dated June 23, 1948 (165) and in a decision on petition for reconsideration of their first decision (175).

At the trial of the case in the District Court, counsel for appellant called the Court's attention to two references not previously cited or relied upon by the tribunals of the Patent Office and urged that these references also negatived patentable novelty or invention in the claimed subject matter. These additional references are:

Dreyfus	1,968,819	Aug. 7, 1934

Society of Dyers and Colourists "Colour Index" 1st Edition January 1924 page 190

Appellees at the trial introduced testimony of the applicants apparently intended to prove that the prior art relied upon by appellant as negativing novelty and invention was inoperative to produce appellees' results. After the testimony was in, the trial Court heard arguments, and then rendered a decision in which it was held that the prior art, singly or in combination did not suggest or teach appellees' process, and that appellees exhibited the uncommon talent, which is the root of invention in a patentable sense. From this decision appellant has appealed.

2. Appellees' Alleged Invention

The specification of the application at bar (139) discloses daylight fluorescent fabrics dyed by a process of dissolving a daylight fluorescent dye in a strong aqueous alcohol or other solution of water and a solvent which swells the fibers of the fabric so that they will absorb the dye, immersing the fabric in the dye bath, maintaining the temperature of the bath below that which swells the filaments of the fabric to coalescence during the time of immersion, and then flushing the fabric with cool water to remove the dye bath. The preferred fabric disclosed in the application is daylight fluorescent cellulose acetate (Finding of Fact No. 2). While the specific description deals with the dyeing of cellulose acetate fabrics, the specification states that other fabrics, such as silk or wool may be similarly dyed with similar results (139). Also, among the dyes mentioned is rhodamine B.

3. The Claims

The claims appear in paragraph 6 of the complaint (3) numbered 4 to 17, inclusive. They fall into two statutory classes. Those numbered 4 to 10 inclusive, 16, and 17, being directed to the dyeing method, while those numbered 11 to 15, inclusive, are directed to the dyed fabric, denominated, in the preamble of the claims "a composition of matter". While the trial Court apparently considered that all the claims stand or fall together, it is submitted that they should be considered separately and that error was committed by the tribunal below in failing to recognize that fact.

Of the method claims, that numbered 6 states in its broadest form the method for which patent protection is sought, while claim 10 appears to present the subject matter most specifically. The method claimed, as defined in claim 6, comprises the following four steps:

1. providing a dye bath by dissolving a daylight fluorescent dye in a strong solution of a solvent and water......................,
2. immersing in said dye bath cellulose acetate fabric ....,
3. removing said fabric before coalescence,

4. flushing said cellulose acetate with water to remove said dye bath.

All the method claims define these four operations or steps, either expressly or by implication, and the most specific of these (claim 10) is so not by the inclusion of other steps but merely because it denominates the dye as one derived from diethylaminophenol, the solvent as alcohol, the temperature of the dye bath as below that at which coalescence occurs, and the flushing water as cool.

Of the composition-product claims, that numbered 11 is the broadest, defining only a fabric of organic filaments and a daylight fluorescent dye dispersed in said filaments. Claim 12 is more limited in that the filaments are defined as cellulose acetate, and claims 13, 14, and 15 are still more limited than claim 12 in specifying the monoalkylaminophenol class of dyes. These claims are believed to be unpatentable for reasons not applicable to the method claims, and the failure of the trial Court to recognize that fact was clearly erroneous.

4. THE PRIOR ART

The British patent to Abel No. 1939 of 1906 ( ) describes the dyeing of cellulose acetate using a dye bath comprising the combination of water and alcohol. Among the dyes mentioned as giving good results with this bath is rhodamine. In Example 1 of the patent the dye bath is used at ordinary room temperature. In Example 3, the dye bath is used at 70° C, and the material after removal from the bath is washed with warm water.

The Rivat French patent No. 847,107 of 1939 (183) relates to the dyeing of cellulose ester textile materials, and teaches that dyes may be fixed on textiles having a cellulose acetate base by utilizing an aqueous medium containing in solution a considerable proportion of a solvent of the cellulose acetate, methyl alcohol being disclosed as such a material. The temperature of the solution does not exceed 25° C, the time of treatment is in general between 15 and 30 minutes and the material is thoroughly washed with cold water after it is removed from the dye bath.

The patent to Dreyfus No. 1,968,819, granted in 1934 (191) describes methods of dyeing textile materials containing cellulose acetate by applying thereto a dye liquor containing a suitable dyestuff and a volatile organic liquid which has a softening or solvent action on the cellulose acetate. Organic liquids miscible with water and in amounts varying from 16% to 40% of the dye liquor are taught. Among the dyes found suitable for application by the described method is rhodamine 3G.O. (color index No. 749). The patentee states that after application of the dye liquor, the fabric is dried, then rinsed, and given any other desired treatment. The colorations obtained are said to be quite brilliant.

The Color Index Publication p. 203 describes the properties of various commercial rhodamine dyes, shows that the characteristic of fluorescence of these dyes in alcoholic solution was well known; and that acetyl silks dyed with such dyes were recognized as exhibiting fluorescence.

STATEMENT OF POINTS

The points on which appellant relies in this appeal are:

(1) The District Court erred in holding that, while the references relied upon by appellant disclose materials and process steps utilized by appellees, none of the references either singly or in combination would suggest or teach appellees' process.

(2) The District Court erred in apparently accepting as conclusive the evidence submitted by appellees that one of the examples of the Abel patent (example 3) was wholly inoperative, and apparently accepting the evidence submitted by appellees that the process disclosed in the Dreyfus patent would not produce a daylight fluorescent fabric, where such evidence was incomplete and did not meet the standard for such evidence set by Bullard et al. v. Coe, 79 U. S. App. D. C. 369, and Blanchard v. Ooms, 80 U. S. App. D. C. 400.

(3) The District Court erred in holding patentable claims 6, 11, and 16 which were conceded by appellees to be too broad and not to include limitations essential to the accomplishment of appellees' results.

(4) The District Court erred in holding patentable claims 11 to 15 inclusive where the novelty, if any, is recited solely in functional and indefinite language, contra to the rule of Gen. Elec. v. Wabash, 304 U. S. 364.

(5) The District Court erred in holding that appellees had exhibited uncommon talent, in allegedly inventing their process and product.

(6) The District Court erred in holding that appellees achieved a new result by their process and

that appellees exhibited inventive ingenuity entitling them to a patent.

(7) The District Court erred in holding that claims 4 to 17 set forth in paragraph 6 of the complaint are patentable.

(8) The District Court erred in not dismissing the complaint.

SUMMARY OF ARGUMENT

1. Each of the patents to Abel and Dreyfus discloses materials and process steps utilized by appellees, and each of these patents is fully anticipatory of the subject matter defined in the process claims sought.

2. The patent to Abel discloses a dying process in which rhodamine dyes may be used, these dyes being inherently fluorescent dyes, in which a cellulose acetate fabric is dipped into the dye solution, which is at room temperature, and which is an aqueous alcohol mixture, and the fabric then processed in the usual manner. In another example of the same patent, a dye solution at a higher temperature is used, and the dyed fabric is rinsed with warm water. This constitutes a complete disclosure of all the materials and all the process steps of appellees, and therefore negatives novelty and patentability in the claims sought.

3. The evidence submitted as to inoperability of Abel was inadequate to be regarded as conclusive under Bullard et al. v. Coe, 79 U. S. App. D. C. 369, and under Blanchard v. Ooms, 80 U. S. App. D. C. 400.

4. The patent to Dreyfus also discloses a process of dyeing cellulose acetate fabrics in which rhodamine B may be used, utilizing in the dyeing solution a volatile

solvent for the cellulose acetate. This patent clearly discloses a rinsing step, but instead of being used prior to drying as in appellee's process it is used subsequent to drying. The change in the sequence of steps does not constitute invention, in the absence of evidence to show that a new and unexpected result flows from such change.

5. The evidence submitted as to the type of product produced when using Dreyfus' method was unsatisfactory, since it admittedly did not faithfully follow the prior art process, and this evidence, likewise, should have been held inconclusive under the standards set by the Bullard and Blanchard decisions, supra.

6. Even if it should be assumed that the teachings of the two different examples of the Abel patent cannot be added together, the French patent 847,107 clearly and distinctly discloses the cool water rinsing step, when dyeing cellulose acetates with analogous dyeing solutions, and the utilization of his teaching in Abel would not be invention.

7. The evidence shows that claims 6 and 16 fail to define the alleged invention with the particularity and distinctness required by Sec. 4888 R. S. The witness testified that the nub and crux of the invention was the use of cool water in the flushing step. Claim 6 does not limit the temperature of the water and claim 16 does not even mention water. The claims stand self-condemned in the record and the trial Court erred in not ruling to that effect.

8. Article claims 11 to 15, inclusive, do not define patentably over the product of Abel or Dreyfus. The

structure recited in the claims finds full response in the prior art. Patentable novelty is being predicated upon functional and indefinite language contrary to the rule of General Electric v. Wabash Appliance, 304 U. S. 364.

9. Article claim 11 stands self-condemned as too broad by the testimony of appellees' witness. There is distinct overclaiming in claim 11 where an organic filament is defined.

THE ARGUMENT

Considering the process claims, and particularly claim 6, which as pointed out above, presents in its broadest aspect the subject matter sought to be monopolized, it is believed to be apparent that the essential feature of this process and the sole feature thereof which is said to vitalize and to impart patentable novelty to the claim is the final step of flushing the cellulose acetate as it is removed from the dye bath with water to remove the dye bath therefrom. A mere inspection of the prior art shows clearly that appellees were not the first to teach or suggest that dyestuffs, including fluorescent dyestuffs, should be applied to cellulose acetate fabrics by utilizing a dye bath containing an aqueous organic solvent solution, the dyestuff being in solution in such a solvent. This is fully and completely shown in both the Abel patent (179) and in the Dreyfus patent (191). Abel distinctly states that neither water alone nor an organic solvent alone will give good dyeing of artificial silk made from acetylated cellulose, (180), but states distinctly that a dye bath containing both water and alcohol gives excellent results (180). The typical result is obtained with dyestuffs among which is mentioned rhodamine. Dreyfus distinctly states that fabrics containing organic derivatives of cellulose are dyed with a dye liquor containing in addition to the dyestuff an organic liquid having a softening effect on the cellulose derivative (191). Furthermore, Abel states that the dyeing process may be carried out in the usual manner and at ordinary or higher temperatures (180). All examples, except example 3 are carried out at room temperature, but in that example a higher temperature is used, and the dyed fabric coming from the bath is rinsed with warmer water.

Since the trial Court found that the references disclose materials and process steps utilized by appellees (Finding of Fact No. 3), it is submitted that the court erred in the holding that "none of said references either singly or in combination would suggest or teach plaintiffs' process", and in holding that "plaintiffs exhibited the uncommon talent, which is the root of invention in the patentable sense, in inventing their process and the product thereof, and said process and product are, therefore, patentable" (Finding of Fact No. 4).

In the first place, it is submitted that both Abel and Dreyfus disclose all the materials and process steps utilized by appellees, and the trial Court apparently so held. That each of these references discloses the same materials is believed to be indisputable. That Abel discloses all the process steps is outlined above and need not be repeated here, and the mere fact that the step of rinsing is only in one example does not militate against the fact that the step is disclosed within the four corners of that patent, and that patent discloses all the steps.

That the patent to Dreyfus discloses all the process steps claimed by appellees is also believed to be indisputable. As pointed out above, Dreyfus discloses the base materials and the dye solution. Rhodamine dye is disclosed as one of the dyes which may be used (196) and a rinsing step subsequent to dyeing is also taught (196). The mere fact that Dreyfus discloses a drying step interposed between the removal of the dyed fabric from the dye bath and the rinsing step is not, in and of itself, sufficient to deprive this reference of its anticipatory nature. Dreyfus teaches dyeing, drying, rinsing; appellees teach dyeing, rinsing, drying. In the absence of strong and convicing evidence of a new and surprising result attributable solely to the change in sequence of steps, no invention exists. Dreyfus states that the colorations obtained are quite brilliant (196). Appellees state that their fabrics brilliantly fluoresce. Given a fluorescent dye in Dreyfus, it is submitted a similar result would be achieved.

Appellees' evidence as to the result produced in Dreyfus was incomplete and inadequate. The exact teaching of the patent was not followed; the final rinsing step was not performed (42) and the brilliant colorations were not produced, as admitted by the witness (50). It is submitted that the minimum requirement should have been a faithful observance of all the conditions and operations described in the patent, if appellees are to be heard to say that the result is unobtainable by following the patentee's teaching, and that the change in sequence of the steps involves invention.

Blanchard v. Ooms, 80 U. S. App. D. C. 400. It is submitted that the trial Court erred in accepting this incomplete and partial comparison with the prior art as conclusive evidence that appellees had achieved a new result never before achieved.

Appellees' evidence with respect to example 3 of the Abel patent likewise was apparently accepted by the trial Court as conclusive of inoperability (65). The acceptance of this testimony, it is submitted, is contra to the rule laid down in Bullard et al v. Coe, 79 U. S. App. D. C. 369, 147 F. 2d 568, that in order to show that appellees' claims are inventive it was necessary for appellees to prove not only that the reference was inoperative, but also that it could not be made operative by slight changes within the skill of the competent person in the art. With respect to Abel, it is submitted that one skilled in the art, knowing that the organic solvent would be more effective to solvate the cellulose acetate fabric at higher temperatures, would necessarily lower the temperature of the dyeing bath, upon finding that destruction of the fabric occurred. Since example 3 of the patent is the only one in which higher temperatures are used, the solution of the problem was present within the disclosure of the patent itself.

In connection with appellees' tests of example 3 of Abel, it is of interest to note that the witness stated that the coalescence and fusion of the fabric was enhanced tremendously by the warm water used for rinsing (66). That being true, it would appear that the use of warm water for rinsing according to appellees' process should be avoided. However, inspection of claim 6 shows no limitation on the temperature of the rinsing water and of claim 16 no limitation to even water. Under these circumstances, it is submitted that the trial Court erred in its ruling that these claims were patentable. The claims stand self-condemned as not particularly and distinctly pointing out the invention as required by Sec. 4888 R. S. (35 U.S.C. 33), and should be denied for that reason also.

However, even assuming that the trial Court in effect ruled that the Abel patent does not disclose the final rinsing step defined in appealed claim 6, that step in combination with dyeing steps utilizing analogous dyeing solutions is old in the art. French patent 847,107 (187) utilizes a cold water rinse for essentially the same reasons that appellees do. To combine that step or to add that step to Abel's dyeing operation as exemplified by example 1 utilizing a rhodamine dye, is, it is submitted, not inventive. In Great Atlantic & Pacific Tea Co. v. Supermarket Equipment Corp., 340 U. S. 147, the Supreme Court has cautioned the courts to scrutinize combination claims "with a care proportioned to the difficulty and improbability of finding invention in an assembly of old elements". When old elements or operation are united with no change in the respective functions, invention is lacking. Here, the concept of rinsing the dyed fabric with cold water to destroy or stop the solvating action of the solvent in the dyeing bath was old in the prior art, and the incoporation or addition of that step to Abel's dyeing process would have been obvious, considering the fact that both patentees were operating on the same fabric with similar solutions. In fact, no addition would be necessary, only the use of cold water for the rinse in example 3 instead of warm water. In the light of these prior disclosures, and the rule of law laid down by the Supreme Court, it is submitted that the trial Court erred in holding that none of the references, either singly or in combination would suggest or teach appellees' process.

Considering the other process claims, it is submitted that they fall with claim 6, for the same references Abel and Dreyfus disclose the rhodamine dyes, and Abel the same solvent, alcohol, while the solvent disclosed in Dreyfus is an obvious equivalent. Other details of the more specific claims such as not more than 2% of dye limitation of claim 16, or the limitation to 40% alcohol of claim 4 admittedly find full response in the references, and appellees have made no contentions below that such limitations are of patentable significance. Under these circumstances, it is submitted that the trial Court's ruling that method claims 4 to 10, 16 and 17 are patentable (Finding of Fact 7) is clearly erroneous and should be reversed.

Now, turning to the composition—product claims, and considering claim 11, it is to be noted that this claim defines structurally only (1) a fabric of organic filaments and (2) a daylight fluorescent dye dispersed in said filaments of said fabric.

Apart from the fact that appellees' witness admitted that all organic filaments would not respond to appellees' process (98), and therefore, the claim seeks to appropriate more than appellees are entitled to under their disclosure it is submitted that the structure defined in the claim, considering the filament to be a cellulose acetate filament, as defined in claim 12, finds full and complete response in the products resulting from the processes disclosed in the prior art; i. e., Abel and Dreyfus. Using a rhodamine dye in the dye baths of Abel and Dreyfus and proceeding according to their teachings the dyed fabric as it is removed from the bath would inherently have the dye dispersed in the filaments of the fabric. Appellees' witness admitted this during cross-examination (121). That being true, the whole emphasis and the vitalizing feature of the claim must depend upon the language "said dye being so arranged and oriented in said filaments of said fabric that said fabric exhibits daylight fluorescence."

As the definition of the patentable novelty of the claim, it is submitted that this claim is clearly functional and indefinite within the meaning of those terms as defined by the Supreme Court in Gen. Elec. Co. v. Wabash Appliance Corp., 304 U. S. 364, and, that it is unpatentable. Since the patentable novelty depends upon so arranging and orienting the dye in the filaments so that the fabric exhibits daylight fluorescence, but there is no definition in the claim specifically and structurally defining that orientation, the claim would appear to use functional language at the exact point of novelty. A claim defining nothing new except in functional terms falls clearly within the field of prohibited indefiniteness. Koebel et al v. Coe, 70 App. D. C. 261, 105 F. 2d 784. Minn. Mining & Mfg. Co. v. Coe, 72 App. D. C. 183, 113 F. 2d 512.

Since claims 12, 13, 14 and 15, though more specific than claim 11, in that they are limited to cellulose acetate filaments, depend for patentability upon the same indefinitely phrased and functional limitation, it is submitted that these claims too do not define patentably over Dreyfus or Abel, since the functional and indefinite description of the orientation of the dye, does not particularly and distinctly point out the invention, as required by Sec. 4888 R. S. The trial Court's failure to so hold was clearly erroneous.

Moreover, the Color Index Publication describes acetyl silks dyed with rhodamine B as exhibiting fluorescence (203). Since Abel's process of dyeing such silks was known to the art, it is submitted that fluorescent fabrics were known to the art prior to appellees' entry into the field. Since fluorescence is exhibited only if the dye particles are dispersed in the surrounding medium, it follows that these fabrics of the prior art meet fully every limitation of claims 11 to 15 except the term "daylight". Patentability, obviously, cannot be predicated upon that term and that term alone. The structural features of the claims finding full response in the products described in this publication, it is submitted that the trial Court erred in holding these claims patentable thereover.

CONCLUSION

It is submitted that the prior art relied upon by appellant below clearly shows that the materials and the steps utilized by appellees are old, both individually and collectively, and that the process and product defined in the claims sought are neither new nor inventive. Further, insofar as the product claims are concerned, the structure recited is old in the prior art, and the novelty, if any, is dependent wholly upon functional and indefinite language within the terms and prohibition against the allowance of claims in Gen. Elec. v. Wabash, supra.

The judgment of the lower Court should be reversed, and the case remanded with instructions to dismiss the complaint.

Respectfully submitted,

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Solicitor, United States Patent Office, Attorney for Appellant.

J. SCHIMMEL,
Of Counsel.

MAY 1951

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In The

United States Court of Appeals

FOR THE DISTRICT OF COLUMBIA CIRCUIT.

United Sta [illegible]
District of [illegible]
FILED [illegible]

APPEAL No. 10,985.

JOHN A. MARZALL,
Commissioner of Patents,
Appellant,

vs.

JOSEPH L. SWITZER and
RICHARD A. WARD,
Appellees.

BRIEF FOR APPELLEES.

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QUESTIONS PRESENTED.

In appellees' opinion, the appeal presents only the following questions relative to the findings of fact of the District Court below:

(a) In view of the District Court's express finding (quoting the Court's voluntary language in the Memorandum Opinion) that appellees have manifest the "uncommon talent" which is the root of invention in the patentable sense and have exhibited the "necessary spark of genius" in attaining "a new result, namely, daylight fluorescent fabrics, or, at least, substantially enhanced qualities of utility, namely, fluorescence of fabrics enhanced to a degree never before conceived of," should such a finding be reversed upon the bare speculations of appellant when such speculations not only have no basis in the evidence of record but are refuted thereby?

(b) As a technical question of claim drafting, is a patent claim reciting the "structure" of a composition of matter invalid because it amplifies the recited "structure" with terms of effect or result which accurately define the essential qualities of the product to one skilled in the art?

An ancillary question of this Court's jurisdiction to hear this appeal was raised interlocutorily.

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In The

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Commissioner of Patents,
Appellant,

vs.

JOSEPH L. SWITZER and
RICHARD A. WARD,
Appellees.

BRIEF FOR APPELLEES.

JURISDICTIONAL STATEMENT.

This action was commenced by appellees under Section 4915 of the Revised Statutes (35 U. S. C. Sec. 63). Appellant did not comply with the decree of the District Court below which, paraphrasing the terms of the statute, authorized appellant to issue a patent on the application in suit on the filing by appellees of a copy of the adjudication herein and their (appellees) "otherwise complying with the law." Instead, after appellees filed a copy of the adjudication below, appellant instituted further proceedings in the District Court and, following statements to the trade press [Exhibit B, affidavit supporting the Motion for Summary Dismissal filed in this Court by appellees], appellant filed this appeal without supersedeas.

Promptly after docketing this appeal, appellees moved for summary dismissal of this appeal on the ground, among others, that the decree of the District Court below was neither a final decree appealable under 28 U. S. C. 1291 nor an appealable interlocutory order under 28 U. S. C. 1292. This Court denied that motion by a per curiam order, without opinion, on June 6, 1951. Appellees petitioned to the Supreme Court for certiorari. Certiorari was denied on November 5, 1951.

Though not of record in the Court below because the fact was not material to any issues there, it is a fact that the invention of the application in suit is licensed directly to the firm of Switzer Brothers, Inc. of Cleveland, Ohio, which organization licenses the manufacture and use of daylight fabrics covered by the application in suit to licensees in the textile field, now numbering over 400. Switzer Brothers, Inc. during the first years of its existence following its organization in 1946 was the only licensed manufacturer in this country of the subject fabrics. With the resumption of the military demand for daylight fluorescent fabrics and the substantial increase in civilian demand, Switzer Brothers, Inc. was wholly unable to meet the demand and now produces only experimental quantities of daylight fluorescent fabrics in the course of maintaining research, production and quality control laboratories for its textile licensees.

Exhibit A of the Affidavit in support of the Motion for Summary Dismissal herein is an advertisement of Arthur Kahn Co., Inc. of New York City. This advertisement states that Kahn, a vendor of fluorescent fabrics, holds a $250,000.00 insurance policy for itself and its customers as indemnity for possible patent infringement arising out of the use and sale of Kahn fabrics. While the indemnity policy is a safe enough one in so far as Arthur Kahn Co., Inc. is concerned as a direct infringer of the claims of the application in suit (so long as the issuance of a patent on the application is delayed by these and possible further proceedings in the Patent Office if appellees succeed in this appeal), the effect of such advertising publicity (plus the trade paper report of the interview with appellant's solicitor stating the intention to take this appeal) has necessarily proved to be an effective impediment in the further licensing under the application in suit. The income from such licensing, as pointed out in the affidavit, is a major item in supporting continued prosecution of the appellees' further research and development in the field opened up by the invention of the application in suit.

With no patent covering daylight fluorescent fabrics, neither appellees nor Switzer Brothers, Inc. have ever threatened Arthur Kahn Co., Inc., Stroblite Co., Dazian's, Inc.[1] or any other fabric vendor with infringement suit. Yet, in an admitted effort to attack the Switzer licensing organization and, purportedly to obtain a declaration that daylight fluorescent fabrics which would be covered by claims of a patent to be issued on the application involved here would be unpatentable, Arthur Kahn Co., Inc. has, *since the filing of the notice of appeal herein,* challenged the patentability of the subject matter of the claims of the application before this Court in this appeal *in no less than three additional suits,* two in the Northern District of Ohio and one in the Northern District of Texas.

It is difficult to conceive that anyone would go to the extent Arthur Kahn Co., Inc. has in order to involve an invention in complex litigation before the patent authorized for the invention has actually issued. But, because of the efforts of the attorneys now acting for Arthur Kahn Co., Inc., this as yet unpatented invention has the perhaps unique distinction of being directly or indirectly under simultaneous attack in litigation now pending in two Courts of Appeal, this Court and the Court of Appeals for the Fifth Circuit[2] and on notice of appeal to still a third, the Court of Appeals for the Sixth Circuit.[3]

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[1] Stroblite Co. and Dazian's, Inc. are unlicensed New York fabric vendors revealed in the District Court's decision as the suppliers of alleged new evidence in the appellant's motion for new trial which the District Court denied. *Switzer et al. v. Marzall,* 96 F. Supp. 332.

In a memorandum dated November 21, 1951, and filed in the Court of Appeals for the Fifth Circuit, Mr. Finnegan, attorney for Arthur Kahn Co., Inc., made the following statement with respect to Kahn's participation in opposing the issuance of a patent on the application in suit before this Court of Appeals for the District of Columbia Circuit:

> "Certain prior art, which in our view completely anticipates this subject matter, was brought to the attention of the Patent Office. This was not done by or on behalf of the Kahn Company, but was done by Mr. Finnegan as counsel for another client. At that time Mr. Finnegan did not and never had represented the Kahn Company. The prior art had not been known to the Patent Office, and had not been presented to the trial court in the District of Columbia. It was immediately recognized as anticipatory of the patent sought; the Patent Office appealed the decision, and sought a new trial based on the newly discovered evidence. Since the entry of judgment in the present [Texas] case, we have presented the Patent Office, as attorneys of the Kahn Company, with additional prior art which is of record here. The Patent

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[2] *Texas-Miller Hat Corp., et al. (Arthur Kahn Co., Inc., intervenor), Appellants v. Switzer Brothers, Inc. and Robert C. Switzer, Appellees,* Appeal No. 13,874.

[3] *Arthur Kahn Co., Inc. v. Switzer Brothers, Inc., Joseph L. Switzer, and Robert C. Switzer,* Civil Action No. 28,165 (U. S. D. C. No. Dist. Ohio, Notice of appeal filed by Kahn, November 1, 1951).

> Office may again seek a new trial on such evidence or may otherwise apply it in rejection of the Switzer claims. We recognize no impropriety in this action. It is an entirely legitimate and natural course for the prospective infringer to seek to prevent court order for issuance of a patent which must be invalid upon the prior art."

In the foregoing statement to the Fifth Circuit Court of Appeals regarding the proceedings in the suit on appeal before this Court, Mr. Finnegan did not bring out that the alleged prior art "not known to the Patent Office" was actually an affidavit by Alexander Strobl of Stroblite Co. regarding the disclosure of the British Abel patent, No. 1939 of 1906, the one reference the Patent Office has always relied upon. Nor did the attorney for Arthur Kahn Co., Inc. reveal to the Court of Appeals for the Fifth Circuit that, instead of being immediately recognized as anticipatory, appellees immediately recognized the Strobl affidavit as being obviously perjured and the District Court below dismissed the affidavit as insufficient. (96 F. Supp. 332, 333.) The statement that the Strobl affidavit, i.e., the alleged "prior art," was immediately recognized as anticipatory is true only to the extent that the appellant's solicitors accepted without apparent question the affidavit furnished by parties hostile to appellees and thereupon immediately moved for a new trial.

The foregoing recount of proceedings relative to the invention of the application in suit and the complex litigation in which it has been involved since the filing of this appeal manifestly and necessarily is outside the record certified from the District Court below. The complexity of those proceedings will necessarily limit any detailed discussion of it in the time normally allotted for final hearing. Yet appellees believe the Court should be apprised of such ancillary matters for the following reasons:

1. The proceedings in other Courts subsequent to the taking of this appeal reveal this appeal for what it really is, namely, part and parcel of an opposition proceeding encouraged by a hostile stranger to the action who believes:

> "It is an entirely legitimate and natural course for the *prospective infringer to seek to prevent a court order for issuance of a patent* which [in the prospective infringer's opinion] must be invalid upon the prior art." (Finnegan's statement in Appeal No. 13,874, CA 5, emphasis supplied.)

In the usual appeals to this Court in which the present appellant is customarily the appellee, considerable weight is given to the contentions of the Patent Office as an administrative bureau acting in behalf of the public.[4] In the instant case the District Court below was evidently thoroughly satisfied that appellees had overcome the weight attached to the proceedings in the Patent Office. Any aurora of dispassionate public interest which might attach to contentions by the Patent Office as a quasi-judicial administrative body in normal R. S. 4915 appeals seems clearly dispelled here, not only by the findings of the Court below but by the practice of appellant's solicitor in discussing appellant's intention to appeal with the trade press before notice of appeal was given. The practice of voicing opinions on pending litigation to the press before voicing them in court is a practice which appellees would question even when confronted by the most antagonistic private litigant. In presenting its case to the press before appealing to this forum, appellant does not come into court with unsoiled hands.

2. It seems impossible in this proceeding to distinguish the conduct of appellant from that which would be

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[4] *Bullard v. Coe,* 147 F. 2d, 568, 569.

taken by a confederate of a party engaged in patent opposition proceedings as followed in the patent systems of some other nations. In such foreign patent opposition proceedings, there is publication that a patent is about to issue unless opposed. Hostile members of the public are then allowed to oppose by presenting new prior art or rearguing the pertinence of prior art of record. In the instant case, the probable imminent issue of a patent on the application in suit upon payment of the final fee[5] was public information at the time the Court below entered its decree. Thereafter alleged new evidence, supplied by a hostile stranger to the proceedings, was first presented to the District Court and now an attempt to reargue evidence of record before issuance of the patent is being made. Adoption of patent opposition proceedings as a reform of the American patent laws has often been proposed, but such proceedings have never been approved by Congress and have been disapproved by the Executive branch of this Government.[6] It is respectfully submitted that the Judicial branch of the Government should not give tacit approval, by hearing this appeal, to what, in substance, has been disapproved by the Executive and Legislative branches.

3. The above-quoted statement to the Court of Appeals for the Fifth Circuit by Mr. Finnegan, attorney for

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[5] *Hoover Co. v. Coe,* 325 U. S. 79, 88.

[6] See "Message from the President of the United States transmitting the Report of the National Patent Planning Commission" 78th Congress, 1st Session, House Document No. 239, in which report recommending several reforms of United States patent laws, it is stated: "X. SUBJECTS CONSIDERED WITHOUT RECOMMENDATION—During the course of its investigation the Commission received and gave serious study to many suggestions and proposals for reforming the patent system which have not been made the subject of recommendation for one or more of the following reasons: (1) The proposed reforms would not be a beneficial innovation in our patent system. Examples of such proposals are * * * opposition proceedings."

Arthur Kahn Co., Inc. points out that, on behalf of Kahn, Finnegan has presented additional "prior art" to the Patent Office. Finnegan goes on to say:

> "The Patent Office may again seek a new trial on such evidence or otherwise apply it in rejection of the Switzer claims."

By applying the alleged new evidence "in rejection of the Switzer claims," it is apparent that Finnegan means that the Patent Office could reject the claims here in suit on such "new evidence" upon dismissal of the present appeal and return of the application in suit to the Patent Office.[7] The news that an actual opposer is still feeding so-called "evidence" to the Patent Office, coupled with the demonstrated practice of the Patent Office in accepting such "evidence" without question, emphasizes to appellees that no matter how long or often they succeed in contesting appellant either in this Court or the Court below in R. S. 4915 proceedings, there can be no finality in any such proceedings. Finality *on the ultimate question in any R. S. 4915 proceedings,* namely, the patentability of the claims of the patent application in suit, can occur only if the patent applicant loses. Whether the patent applicant succeeds in the District Court or this Court, the appellant can always reopen the question of patentability when the case returns to his bureau by citing new evidence or instituting interference proceedings.[8]

Because of the emphasis brought on by the statements in other litigation which were recently made by the opposer having a direct interest in delaying or preventing issuance of a patent on the application in suit, appellees feel compelled to request this Court to reconsider the finality, in an appealable sense, of the judgment of the District Court below, and, thus, the jurisdiction of this Court under 28 U. S. C. 1291-2. As stated by this Court in *Southland Industries v. Federal Communications Commission,* 99 F. 2d 117, 118:

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[7] [8] *Hoover Co. v. Coe,* 329 U. S. 79, 88-89.

> "It is a well recognized principle that an appeal cannot be taken from an interlocutory order (Metzger v. Kelly, 34 App. D. C. 548), or from a judgment or decree 'not final as to all the parties, the whole subject-matter and all the causes of action involved, * * * and that if the judgment or decree be not thus final and complete, the writ of error or appeal must be dismissed for want of jurisdiction.' Arnold v. United States for use of Guimarin & Co., 263 U. S. 427, 434."

Appellees are hesitant to raise this question again, despite the re-emphasis of the interlocutory nature of the proceedings below by occurrences in other litigation. As a practical matter to avoid an appearance of being too hardheaded, but for such re-emphasis appellees would be inclined to acquiesce and accept the Court's interlocutory adverse ruling on this question of its jurisdiction, especially after the interlocutory ruling was practically, though not conclusively, affirmed by the Supreme Court's denial of certiorari. Yet in making this request for a final reconsideration of the jurisdiction of this Court in this appeal, appellees are guided by another statement of this Court in the decision immediately following its decision in the above-quoted *Southland Industries* decision, namely, *Woodmen of the World, etc. v. Federal Communications Commission,* 99 F. 2d 122, 123, in which this Court stated further:

> "Jurisdiction cannot be given to a court by consent, *acquiescence,* or inadvertence. It can acquire jurisdiction only by authority of law. It is immaterial, therefore, what the situation may be 'as a practical matter.'" (Emphasis supplied.)

STATEMENT OF THE CASE.

1. THE INVENTION.

In order that the discussion of the proceedings below and the present and past confusion of the Patent Office evident therein may be viewed in a clearer perspective, appellees must depart from presentation of subjects in the order employed by appellant and present, as the first matter after the hesitantly advanced question of jurisdiction, a discussion of the invention disclosed by the application in suit.

One would look in vain in appellant's brief for any hint as to the utility of the daylight fluorescent fabrics invented by appellees and be left completely in the dark as to why the District Court below voluntarily used the language "necessary spark of genius" and "'uncommon talent,' which is the root of invention in a patentable sense"[9] to designate in its Memorandum Opinion the advance in the art which applicants have made.

As is revealed by the District Court's language in its Opinion (App. p. 15), appellees have obtained a "new and useful result never before attained."[10] This result is "daylight fluorescent" fabric and explains, on the one hand, why established firms, as mentioned by the Court, have taken licenses under the application in suit and why other firms, such as Arthur Kahn Co., Inc., have recently gone to such extremes to effect a delay in, and, possibly prevent, issuance of the authorized patent by working on appellant as well as by desperately filing a harassing multiplicity of appeals in other courts.

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[9] Appendix, p. 15. These terms were chosen by the Court on its own initiative; they were not employed in appellees' arguments or the memoranda on authorities. Likewise, the Court made its own law search after submission of memoranda on authorities by the parties. Of the authorities cited in the footnotes to the Court's opinion, Nos. 1, 4, 5, 6, 9, and 11 were selected by the Court as a consequence of its own independent and thorough consideration of the case.

[10] *Blanchard v. Ooms,* 80 U. S. Apps. DC 400, 153 F. 2d 651, 652, where this Court cites *Simplex Box Corporation et al. v. Rosenthal Paper Co.,* 104 F. 2d 349, 352 (CA 8).

What are these daylight fluorescent fabrics that have excited the widespread recognition by "industry, Government [actually foreign governments as well as the United States Government] and the public" (as found by the District Court) as well as the left-handed recognition by over-litigious unlicensed New York fabric vendors? As will be evident from the physical samples of record (Pl. Ex. 2) these are fabrics which have a brightness of color in daylight several times greater than that which had been achieved before in the science of dyeing fabric. (See the chart in the "Textile World" article, Pl. Ex. 9.) Aside from the facts (as it is believed the Court will take judicial notice) that man has always been seeking brighter and better colors and the dye chemists who constitute the inner circle of those skilled in chemistry have been engaged for years in efforts to satisfy this demand, daylight fluorescent fabrics have a utility far beyond that of merely supplying brighter colors. This greater utility of daylight fluorescent fabrics is that, because of the extreme brightness and purity of color, they may be seen and their color recognized at distances several times greater than ordinary color. Daylight fluorescent fabrics thus met an urgent demand for high color visible military signalling during World War II, as in ground-to-air signalling between tanks and aircraft, on aircraft carriers for landing operations and many other uses (including sea-rescue work, landing operations, and the like) (App. pp. 37, 51, 56, 60; Pls. Ex. 9, 10. See also Exhibits A and B of Paper No. 6, File Wrapper of proceedings in Patent Office, Pl. Ex. 1). During the War the Government procured about eleven million (11,000,000) yards of such fabric for military signalling purposes (App. p. 95).

And just what is "daylight" fluorescence? To explain this, one should first consider (a) the ordinary "black light" or "Woods light" fluorescence (referred to throughout the record in contrast to daylight fluorescence) and (b) ordinary color. First, in "black light" fluorescence, under the influence of invisible ultraviolet light (from which visible light has been filtered) certain substances will "fluoresce," i.e., emit visible light. Without excitation by ultraviolet light, however, the color of such ordinary or "black light" fluorescent materials in ordinary daylight is no different to any appreciable degree from ordinary colors. Second, as is well known, ordinary colors exhibit their colors in daylight because they selectively reflect a given color in the incident visible light and absorb the balance of the colors in the incident light. For this reason, ordinary colors are referred to as "subtractive colors." For example, an ordinary red fabric appears red in daylight because it selectively reflects some of the red in the incident daylight and absorbs or "subtracts" the violet, blue, green, yellow, and orange components of the incident white light.

(a) Daylight Fluorescent Fabrics.

As demonstrated to the Court by Joseph L. Switzer (App. p. 34), daylight fluorescent fabrics do three things: (a) they fluoresce most brilliantly (and efficiently) under invisible ultraviolet light; (b) they exhibit a subtractive color, as do ordinary, non-fluorescent colored fabrics; and (c), most importantly, *they fluoresce in response to ordinary visible light*. Thus, the dyes in daylight fluorescent fabric achieve their brilliant color in visible light by simultaneously performing functions (b) and (c) above.

As demonstrated, by heating a sample of daylight fluorescent fabric under visible light to a temperature such that the dye molecules lose their ability to fluoresce, but not to exhibit their subtractive color, the color of the sample became that of a swatch of fabric (Pl. Ex. 3 ~~2~~) dyed with the same dye in the same amount in a standard non-fluorescent fashion. But as the daylight fluorescent sample cooled and regained its ability to fluoresce under the visible light to which it was exposed, it again returned to its brilliant daylight fluorescent condition. *Whereas an ordinary red fabric wastes and dissipates the energy of the violet, blue, green, yellow and orange light energy which it subtracts,* daylight fluorescent fabrics exhibit a combined color, its subtractive color and its fluorescent color. *Daylight fluorescent fabrics utilize the light energy dissipated by ordinary colors to emit a fluorescent light in addition to* ed *~~incident~~ light.* Until the reflected and emitted light of substantially the same hue in the daylight fluorescent fabric are separated, as by heating, the eye sees a fabric of greater color brightness than ever attained by ordinary subtractive colors.

As stated in the specification of the application in suit:

> "The term 'daylight fluorescent' is employed to denote the phenomenon exhibited by materials which not only reflect portions of the spectrum incident visible light but simultaneously fluoresce under the influence of the incident light." (App. pp. 149-150.)

In the Memorandum Opinion (App. p. 14) the trial Court observed that none of the references relied upon by appellant gave any hint of the phenomenon of daylight fluorescence or how it could be achieved.

This remarkable and useful result of producing a fabric which exhibits this peculiar and novel phenomenon is all the more remarkable because it can be achieved in fabrics consisting of nothing more than fabric filaments which are concededly old and dyestuffs which are likewise concededly about the oldest of the known synthetic dyestuffs.

The appellant fails yet to realize what was told in the specification and on the witness stand by the appellees Switzer (App. pp. 29-30, 69-70 and elsewhere) and Ward (App. pp. 45-60), namely, in their fabric and by their process, appellees achieve a different function and different result *because the molecules of the dyes in their fabrics are dispersed and oriented differently in the fabric filaments than in prior art fabrics.* As explained by both the witnesses and the specification (App. p. 142) it is now known (after the daylight fluorescent fabrics have been achieved) that the ability of the dyes to exhibit daylight fluorescence depends upon the distribution and spacing, i.e., *dispersion,* of the dye in the fiber. If the dye molecules are closely packed together (as by using higher than about two percent of the dye with respect to the weight of the dyed filament or by concentrating the dye on or in the surface of the filaments) the dyes lose their ability to respond to incident visible light, i.e., to exhibit appreciable daylight fluorescence. If the daylight fluorescent dye molecules are dispersed, however, then the molecules are able to exhibit and perform this phenomenon.

Essentially the difference between prior art fabrics of the same dyes and filaments and appellees' fabrics are shown diagrammatically in the drawings of the application (App. p. 154A).

As explained by Mr. Switzer (App. pp. 33-34), *in prior art dyeing* the object of the dyer is to get the dye out of solution in the dyebath (i.e. "exhaust" the dyebath) onto the fabric filaments, where the dye becomes fixed.

The mechanism by which this is accomplished depends upon the affinity of the dye to the fabric filaments. If the dye has "affinity" for the filaments, the dye slowly exhausts itself onto the filament surfaces, to which the molecules have a stronger affinity than to solvents in the dyebath. If the dye has no particular affinity for the filament, that is, an equal or greater affinity or tendency to remain in the dyebath than to affix itself to the surfaces of the filament, then other expedients must be used to temporarily deposit the dye molecules on the filament surfaces and then fix the deposited dye by suitable fixing treatment. This temporary surface deposit can be achieved by adding an agent to the dyebath [a "salting out" agent] which renders the dye less soluble in the dyebath and causes the dye to deposit on the filaments. Or fabric wetted with the dyebath can be dried; as the liquids in the dyebath evaporate, the dye is deposited or "plated" on the filaments. This latter expedient is that employed by the references Abel and Dreyfus (App. pp. 69-70, 71-72) ("plaited" should read "plated").

Any of the foregoing prior art procedures leave the filaments with a high concentration of dye molecules 11 in and on the surface of the filament 10, as shown in Fig. 1 of the application drawings (App. p. 30; p. 154 A). For normal colors this has been a perfectly satisfactory orientation of the dye molecules on the filaments; by coloring the surface of the filament, the dyer achieved a fabric with a concentration of the dye where it seemingly did the most good, that is, in a relatively undilute condition over the surface of the filaments. Unfortunately for dyes which might be capable of exhibiting daylight fluorescence, however, this concentration prevented such dyes from exhibiting that phenomenon. As stated by Ward on cross examination, the curious thing about daylight fluorescent dye molecules is that, if they are packed tightly, they interfere with each other and prevent the desired fluorescence; the fault with the Abel and Dreyfus methods is that there is too much dye present and a daylight fluorescent dye would not have an opportunity to arrange itself in the filaments to exhibit daylight fluorescence (App. pp. 45-46).

Appellees' daylight fluorescent filaments are shown in Fig. 2 of the application drawings (App. p. 154A). With the same filament and the same number of dye molecules as are present in the filament of Fig. 1, but with the molecules dispersed inside the filament rather than concentrated at the surface, a daylight fluorescent filament is obtained (App. pp. 30-31).

In terms of dimensions of feet and inches, the structurally different arrangement of the same number of dye molecules in daylight fluorescent and non-daylight fluorescent fabrics may seem insignificant and this seems to have been the stand taken by the Patent Office. But, as shown by the results, and the results were what impressed the Court below, in terms of molecular dimensions the difference between the arrangement of molecules in the prior art and in appellees' fabrics, in so far as the daylight fluorescent functioning of the molecules themselves is concerned, is the difference between functioning and not functioning to produce the novel phenomenon of daylight fluorescent.

In stating the standard of patentable inventions in the recent case of *A. & P. Tea Co. v. Supermarket Corp.*, the Supreme Court pointed out:

> "The conjunction or concert of known elements must contribute something; only *when the whole in some way exceeds the sum of its parts* is the accumulation of old devices patentable. *Elements may, of course, especially in chemistry or electronics, take on some new*

> *quality or* function *from being brought into concert,* but this is not a usual result of uniting elements old in mechanics." (340 U. S. 147, 152, emphasis supplied.)

Appellees clearly meet this "severe test" of the majority opinion of the Supreme Court in the *A. & P.* case. The mathematical analogy of the whole exceeding the sum of its parts can be aptly applied in a diagrammatic fashion to the present invention. Letting 1's equal dye molecules and 2's equal filament molecules, the sum of color produced by the elements in prior art dyeings may be expressed as follows:

$$1 + 1 + 2 + 2 + 2 + 2 + 2 + 1 + 1 = 14$$

In the above equation the dye molecules 1 are concentrated on the outside of the filament molecules 2. The position taken by the appellant is that four 1's and five 2's total 14, regardless of how you bring them together. But appellees have demonstrated that, with daylight fluorescent dye molecules dispersed in a fabric filament, rather than by concentrating the dye molecules on the outside of the filament, they can get a color brightness and visibility one and three-quarters to four times greater than prior art colors (depending upon lighting conditions). See the chart, Exhibit B, of paper 6 in the File Wrapper of the application in suit (Pl. Ex. 1). And since (1¾ to 4) × 14 = 24 to 58, the whole of the color produced by appellees by dispersing the dye (1's) in the filament (2's) may be expressed by the seemingly impossible equation:

$$2 + 1 + 2 + 1 + 2 + 1 + 2 + 1 + 2 = 24 \text{ to } 58$$

Not only have appellees met the standard of having the whole exceed the sum of its parts, as set out in the majority opinion in the *A. & P.* case but they clearly met the standard set for patentable inventions by Justices Douglas and Black in the minority opinion in that case, namely:

> "The invention, to justify a patent, had to serve the ends of science—to push back the frontiers of chemistry, physics and the like; to make a distinct contribution to science." (340 U. S. 154.)

In showing how to obtain brighter colors than ever attained before, through molecular dispersion of daylight fluorescent dyes in a filament, it seems manifest that appellees have pushed back the frontiers of dye chemistry and physics. It is to be noted that the District Court found that none of the prior art references relied upon there by appellant related to anything more than black light fluorescence; none of the prior art suggested anything of daylight fluorescence and that appellees had attained a result never before attained or *conceived of* (App. pp. 14, 15). Despite the misconception of prior art dyeing process which appellant advances, even appellant does not contend that the prior art actually discloses daylight fluorescent fabrics as such; appellant attacks only the form of the claims drawn to daylight fluorescent fabrics, not the invention of the fabrics as such. It seems clear, therefore, that appellees have made a distinct contribution to the science of color and fabrics.

(b) Appellees' Method of Producing Daylight Fluorescent Fabrics.

Appellees do not contend, and never have, that, knowing that daylight fluorescent fabrics could be attained and what the structure, in terms of molecular dispersion of the dye might be, others skilled in the art *might* not be able to modify processes for producing nonfluorescent fabrics so that, by substituting dyes, modifying process steps, adding a process step from one process to the steps of another, reversing the order of process steps, and the like, one skilled in the art might not be able to produce a daylight fluorescent fabric. In fact, *knowing what to get* in an art as highly developed as the textile dyeing arts, developing a method of daylight fluorescent dyeing might have been easy. But since daylight fluorescent fabrics as such were not conceived of nor their utility appreciated or dreamed of, any comparison at this time of appellees' process with prior art processes which give no hint of the results appellees achieved, must take into account the factor of hindsight reasoning. This the appellant has never done. Indeed, it is evident that appellant has lost sight of the fact that, in order to produce their daylight fluorescent fabric, appellees first had to discover the process which produced the fabric, and in so discovering that process they were embarked in the sea of virtually unlimited possible processes without charts or guides for the course to pursue.

(b)-1. Prior Art Dyeing.

As appellant has pointed out, appellees' claims fall into two statutory classes (a) claims (11 to 15) drawn to daylight fluorescent fabric as a composition of matter and (b) claims (4 to 10, 16 and 17) drawn to the art, i. e., process or method of producing daylight fluorescent fabrics. In order that the significance of appellees' process may be viewed in perspective, it will be described in comparison with the prior art now relied upon by appellant. In this connection, it should be pointed out that, as shown by the file wrapper of the application in suit, during the seven years of prosecution in the Patent Office, no less than twenty-eight (28) items of prior art were cited against appellees' claims, comprising twelve United States, British, French, and German patents and sixteen United States, British, French and German publications, such as technical magazine articles, dyestuff tables, and textbooks on the dyeing art. Out of this extensive citation of prior art, appellant boiled the twenty-eight cited in the Patent Office to ten pleaded and cited before the District Court and now to four relied upon in this appeal, namely:

1. Colour Index of the Society of Dyes and Colourists, a British Publication of 1924 (and thus anticipatory, under the rule of this and other Courts only if what is disclosed in the foreign publication is disclosed in such full, clear, and exact terms as to enable any person skilled in the art to practice the subject matter of the allegedly anticipated claim without the necessity of making experiments.)[11]
2. British Patent to Abel, 1939 of 1906, likewise subject to the rule applicable to Colour Index.
3. French Patent to Rivat, No. 847,107 of 1939, also subject to the foreign patent rule.
4. U. S. Patent Dreyfus, No. 1,968,819 of 1931.

Of the above four references, only the Colour Index mentions anything of fluorescent dyes or dyeing. The Colour Index does mention that certain rhodamine dyes are "fluorescent" in solution and may or may not show fluorescence on textiles, but the reference does not say whether the word "fluorescent" meant black light or daylight fluorescence. Joseph L. Switzer testified that, as used in the literature cited in the Colour Index as the authority for the statements therein, the word "fluorescent" meant "black light fluorescent," for it was the practice of dye chemists to examine dyes under a "Woods light" (black light) (App. pp. 92-93, 182). Appellant's solicitor conceded that he had "made an investigation" to determine what was meant by the term "fluorescent" in Colour Index and had been unable to "unearth anything to distinguish between the different types of light, whether black light or daylight." (App. p. 133). Colour Index says nothing about the process by which the dyes may be applied to the fabrics. Against the affirmative testimony of Switzer that the reference referred only to black light fluorescence, we have the admission of appellant to the District Court that it was only speculating as to the meaning of this foreign reference. Anything that appellant tries to make out of this foreign reference now is still speculative.

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[11] *Seymour v. Osborne*, 78 U. S. 516, 555;
Carson v. American Smelting & Ref. Co., 4 F. 2d 463, 465 (CA 9);
In re Ek, 57 Apps. D. C. 203, 19 F. 2d 677;
Davies v. Coe (Apps. D. C.), 83 F. 2d 602, 603;
Wisconsin Alumni R. Found. v. Geo. A. Breon Co., Inc., 85 F. 2d 166, 167 (CA 8);
Becket v. Coe, 69 Apps. D. C. 51, 98 F. 2d 332, 335;
Steiner Sales Co. v. Schwartz Sales Co., 98 F. 2d 999, 1003 (CA 10);
Kelley-Koelt Mfg. Co. v. McEven, 130 F. 2d 488, 491 (CA 6);
Baldwin-Southwark v. Coe (Apps. D. C.), 133 F. 2d 359, 365-6;
Hollywood-Maxwell Co. v. Streets of Tulsa, 183 F. 2d 261, 263 (CA 10).

The British patent of 1906 to Abel, upon which appellant has always relied heavily, is defective in several respects. First, it mentions only one type of dye which might be daylight fluorescent, namely "rhodamine" (App. p. 80); but it does not say which of the many rhodamines are to be used. Some rhodamine dyes are daylight fluorescent but not all rhodamine dyes are fluorescent. (See testimony of Switzer, App. p. 68 and the left-handed admission of the Patent Office Examiner, who contended that "almost all" rhodamines are fluorescent) (App. p. 161). Appellant must only speculate that the British patent contemplated the use of daylight fluorescent dyes. Secondly, the reference does not disclose the use of the "rhodamine" in any specific example nor does the reference say that "good results" are obtained, as appellant misquotes the reference at page 6 of his brief. Rather, as one of the suggested alternatives to the dyes employed in the actual examples, the foreign reference says that the "typical result" of deep or dark tints may be obtained with other dyes, among which rhodamine is mentioned (App. p. 180). Appellant is speculating that by experimentation with alternative suggestions of a foreign reference, one might achieve appellees' method and result; this and other Courts have repeatedly pointed out that a foreign reference is not competent and anticipatory where experimentation is required, as by substituting suggested alternatives in specific examples.[12] Thirdly, both Switzer and Ward testified that *even if* one substituted a daylight fluorescent rhodamine and then otherwise followed the operative examples of Abel, one obtained fabric with the deep shades Abel repeatedly says one would obtain, *but not daylight fluorescent fabric.* See Exhibit 5-A (Ward testimony, App. pp. 40, 44 *et seq.,* Switzer testimony, App. pp. 67-69). Fourthly, Abel does not disclose the key step of flushing, preferably, with cool water, to remove the dyebath from the fabric after it is taken out of the dyetank in which it was immersed. In one example, No. 3, using a non-fluorescent dyebath, Abel does say the material is "washed in warm water." But Switzer testified that even before the washing step was reached in this example, the fabric was destroyed in the dyebath and that example was thus inoperative (App. pp. 66-67). Fifthly, it seems almost brazen for appellant to continue to rely upon Abel; unconvinced that Exhibit 5-A showed a fabric dyed by the Abel process, appellant moved for a new trial on the basis of an affidavit of Alexander Strobl. In dismissing the motion for new trial and the Strobl affidavit as insufficient, the District Court said:

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[12] *Baldwin-Southwark v. Coe, supra,* at 133 F. 2d 365-6 and other cases cited in footnote 11. See also, *Nye v. Coe,* 44 F. S. 582, 584.

> "Although Mr. Strobl states in his affidavit that he performed his experiments following the exact descriptions in the Abel patent, it is apparent on the face of the affidavit, by a comparison of his account of these experiments with the descriptions in the Abel patent, that he did not follow exactly the Abel descriptions." (*Switzer v. Marzall,* 96 F. Supp. 332, 333.)

Even after submitting a purported effort to obtain daylight fluorescent fabrics according to Abel, which effort the Court rejected as being inaccurate on its face, appellant unabashedly pursues this reference.

The competence of the French patent to Rivat is not apparent. It says nothing of fluorescence whatsoever and appellant has never contended that any of its suggested dyes are daylight fluorescent or even black light fluorescent which, as vat dyes, they will not be. As shown on the face of the patent, it relates to direct dyeing with vat dyes which are reduced and fixed on the fabric in the dyebath phase (App. pp. 185, 186) before washing. An insoluble dyestuff is formed by such reduction and fixation (App. p. 185) a theory wholly foreign to appellees' steps to disperse their daylight fluorescent dyes in a state akin to solution. Appellant's apparently only purpose in citing the patent is to show that in *other types* of dyeing processes, rinsing the fixed dyed filaments is old. Appellees do not understand that they are claiming the step, as such, of rinsing a dyed fabric with cold water.

The United States patent to Dreyfus was cited by the Patent Examiner against the application in suit in the very first action taken by the Patent Office on September 14, 1942 (Paper No. 3, File Wrapper, Pl. Ex. 1). Thereafter the reference was dropped, neither being cited by the Examiner to the Board of Appeals after final rejection, relied upon by the Board of Appeals, nor pleaded in answer to the complaint below. It appears of record because appellant's counsel waited until the afternoon the trial began and, in his opening statement reported that it was regarded by appellant as having anticipatory value. Appellees complained of the surprise, but to prevent any further delay in the case, called the witness Ward in Cleveland, Ohio by long distance, asked him to test the reference and then had Ward available for testimony regarding it when the trial resumed the following morning. (App. pp. 38-39.) There are several faults with Dreyfus. First, Dreyfus says nothing about either fluorescence or anything that would suggest daylight fluorescence. Rather he speaks repeatedly of obtaining "depth of color" and, following his example, states that the colors obtained "are of great depth for the amount of dyestuff employed." Secondly, of the twenty-nine possible dyestuffs named, only the last, a "rhodamine 3GO" would offer any possibility of daylight fluorescence. However, whether rhodamine 3GO is actually a daylight fluorescent dye cannot be established.[13] In parenthesis after "rhodamine 3GO," Dreyfus lists a color index No. 749. Under the number 749, Colour Index (App. p. 202) lists several variants of dyes which would be daylight fluorescent in appellees' fabric as dyed by their process. But rhodamine 3GO, however, is not listed under the Index No. 749 or any other number of the Colour Index. As stated by Switzer, the disclosure is confused (App. p. 74). At this state of the suit, it is merely an assumption on appellant's part that the twenty-ninth and last dye in the list of Dreyfus dyes is a daylight fluorescent dye. Thirdly, *even when a known daylight*

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[13] Since the trial, appellees have tried to locate rhodamine 3GO on commercial dyestuff lists, but to no avail.

flourescent dye is substituted for rhodamine 3GO in the Dreyfus example, the result is a red fabric of great depth and brilliance of color, as Dreyfus predicted, *but not daylight fluorescent*. See Exhibit 5-B. And finally, Dreyfus misses the critical order of appellees' process steps by drying his fabric to completely remove the liquids of the mechanically impregnated dyebath after application of the dyebath. As pointed out below, it is the flushing the fabric with water to remove the dyebath from the wet fabric which is a critical order of steps in appellees' process. Still further deficiencies of Dreyfus will be apparent from the following statement of the order of appellees' process:

(b)-2. Process Steps and Order Thereof.

Appellant contends (Br. p. 5) that Claim 6 (App. p. 4) of the application in suit is appellant's broadest method claim. By distinguishing this claim over the above prior art, the various narrower method claims must necessarily be distinguished. The four process steps of Claim 6 are as follows:

> (a) "* * * providing a dye bath by dissolving a daylight fluorescent dye in a strong solution of a solvent and water, said dye being characterized by its lesser solubility in water than in said solvent, in which solvent said dye, water, and cellulose acetate are each soluble, * * *."

Colour Index merely lists dyes (e.g., rhodamine B) which would meet the requirement of the dye called for in the foregoing step, both as to daylight fluorescence and the characteristic of having a lesser solubility in water than in the solvent; Colour Index does not, in listing such dyes, disclose that the listed dyes do possess the required characteristics. Nor does Colour Index disclose the mixed strong solution of water and solvent, an essential requirement of the process. Appellant can only speculate as to whether Abel or Dreyfus disclose a daylight fluorescent dye; nothing whatever is said of the requisite characteristic of lesser solubility of the dye in water than in the solvent. Rivat (French) discloses nothing as to the dye. Not one of the references can meet the terms of the first step.

> (b) "* * * immersing in said dyebath cellulose acetate fabric characterized by its tendency to be swollen to incipient coalescence by said dye bath, * * *."

Since none of the prior art discloses the "said dyebath" as called for, this step, in terms, is not met. Further, the whole teaching of Dreyfus is to avoid prolonged immersion but to effect dyeing by mechanical impregnation.

> (c) "* * * removing said fabric before coalescence. * * *"

Abel teaches nothing regarding this step. Dreyfus, who impregnates the fabric mechanically, merely dips the fabric in a dye bath or applies dyebath by a padding mangle; the fabric is not submerged in the dyebath a sufficient length of time to make coalescence a problem and, therefore, teaches nothing of the necessity of this step. Colour Index and Rivat teach nothing of this step.

> (d) "* * * and then flushing said cellulose acetate fabric with water to remove said dyebath." [This is the last step of the claim. The examples of the specification point out that upon completion of this step, the still wet fabric may be then "tentered and calendered" (dried under slight tension in a frame and ironed) in the usual manner.]

The above final step of the process as claimed, as evident throughout the Switzer and Ward testimony, particularly on cross-examination, is, from a consideration of its effect in the order of the steps, perhaps the key to appellees' process. It is the step which locks the dye molecules in a disperse condition akin to solution in the filament. It is the step which prevents the concentration of dyestuff on the surface of the filament and prevents excrescence and migration to the surface of the filament of dyestuff which, during immersion, has penetrated into the filament. Appellees avoid drying after immersion while free dyebath wets the fabric, as in Dreyfus and the operative examples of Abel, who effect a fatal plating of dyestuff on the surface of the filament. Such plating is caused both by deposition of dyestuff through evaporation of the liquid in the dyebath on the outside of the filament and migration or excrescence to the surface of the filament of such dye as might have been carried into the filament but which moves with the volatile portions of the dyebath as it dries out of the filament relatively slowly. (Ward, App. pp. 44-48; Switzer, App. pp. 69-73; 102, 114, 122-123.)

Flushing the daylight fluorescent fabric after it emerges from the dying tank and still is wetted with the dyebath accounts, due to the order of the steps, for the dispersion of daylight fluorescent dyestuff obtained by appellees. Appellant's solicitor tried hard to confuse the witness Switzer with respect to the practice of rinsing fabrics after dyeing, but failed to do so. Since there is no contention that rinsing may be commonly practiced, *after the dye is fixed,* the witness Switzer admitted that rinsing with cool water while the fabric is still wetted with dyebath may be followed in other dyeing techniques [such as Rivat] in which the dye possesses an affinity for the fabric and, therefore, becomes fixed to the filaments in the dye bath. But with dyes which have no affinity for the fabric (as in this case and in Abel and Dreyfus), it was not a seemingly logical step to rinse off the filament surfaces, before fixing, a dye which did not want to go onto the fabric in the first place, especially when the dyer had gone to substantial trouble to get the dye on the fabric so that he could subsequently fix it there. (Switzer, App. pp. 106, 107.)

Dreyfus repeatedly points out that he dries his fabric after applying the dyebath; rinsing is one of the optional treatments which may be given after drying (App. p. 195). Dreyfus, therefore, simply followed what seemed logical and customary sequence of operations in dyeing practice. If it could be possible to obtain daylight fluorescent fabrics by modifying Dreyfus' disclosure in using a known daylight fluorescent dye (rather than a questionable one) and by reversing the order of drying and flushing or rinsing (mandatory with appellees, optional with Dreyfus), such a possibility is manifestly suggested by appellees and not Dreyfus. The Patent Office below tacitly conceded this fact by not relying upon Dreyfus as a reference after the first Office Action. The District Court below affirmatively found that neither Dreyfus nor Abel, alone or in combination with other references, suggests appellees' process.

Appellant only speculates (and shows nothing of record clearly establishing) that the District Court was in error. Appellees point out on the record where and how the fact of non-anticipation as found by the District Court is supported by evidence.

(c) Recognition of Appellees' Invention.

It seems evident from the strong language employed by the District Court in the next-to-last paragraph of the Memorandum Opinion that it did not regard appellant's challenge of appellees' claim of patentable invention as presenting even a close question. However, in the last paragraph the Court went on to say that if it were conceded that the question could be close, then the commercial success and wide-spread recognition of appellees' invention would tip the scales in their favor.

The recognition by industry in general of this particular invention is more than usual commercial success measured in terms of the large amount of goods sold (as there has been, App. pp. 95, 97). Rather, the nature and character of the firms, both in this country and abroad who, by license or admissions against interest, have acknowledged appellees' invention rebuts, in substance, the very references appellant is relying upon. Incidentally, such evidence further establishes the soundness of the rule of the Court against reading information into foreign patents which do not require definiteness or accuracy of disclosure as required by United States patents.

Because appellant was willing to concede commercial success and utility of the invention (App. pp. 52-53) and because the probative value of certain evidence offered but not accepted had not yet become too apparent, the Court cut off certain evidence and testimony as hearsay. Appellees do not contest that much of such evidence as the Court did reject (App. pp. 27, 54 through 65) was hearsay, but as will be brought out below, it is believed it could have been accepted as being in the nature of general admissions against interest to be weighed in construing patents and publications which appellant has urged as having an anticipatory effect.

As to the evidence of acknowledgment of appellees' invention which was admitted without objection, we have the following:

(1) American textile dyeing concerns such as Aberfoyle Manufacturing Co. (one of the world's largest yarn dyers with foreign as well as domestic plants); Atlantic Rayon Co. (of Providence, R. I.); Virginia Dye Works;

Liberty Dye Works (of Reading, Pennsylvania); Jeffries Dye Works (of Philadelphia) and the like, have accepted licenses (App. pp. 95-96). It is through these concerns, rather than appellees, that substantial civilian sales have been made. Acknowledgment of inventions by firms such as Aberfoyle, with its world-wide operations, would alone tend to undermine the gist of appellant's contention that, based upon domestic and foreign references, one skilled in the art would not accept applicant's fabrics and method as inventive. Aberfoyle is certainly skilled in the art and manifestly would be chargeable with knowledge of domestic and foreign references if any one would.

(2) The witness Geoffrey Dane, of one of appellees' British licensees, Dane & Co., Ltd., colorists, testified that the daylight fluorescent colors of appellees' fabrics were new and novel to the "colorist" trade in which Dane and his company were engaged in Europe. The implications which appellant wishes to draw from the old Abel patent and the Colour Index of the British Society of Dyers and Colourists seem to be refuted by the testimony of the colorist Dane.

(3) The license taken by the firm of Establishments Masurel et Freres, S. A., of Lille, France, seems especially remarkable. As shown by the record (App. p. 96), this very large European firm of yarn dyers, with full knowledge that appellees have no present or pending patent rights in France, nonetheless pays royalties simply in consideration for the know-how obtained from appellees. This certainly refutes any speculations appellant may make as to the teaching by the French patent Rivat of information to be read in to the British patent to Abel.

(4) The conduct of Celanese Corporation (of which none other than Camille Dreyfus of the Dreyfus reference was the founder and still active head when the military

demand for appellees' fabrics arose) seems to refute whatever speculations appellant makes as to anticipatory matter to be inferred from the Dreyfus patent. As evident from plaintiff's Exhibit 6 and the testimony relative thereto (App. pp. 50-56), very large firms in the textile, dye, and fluorescent lighting business were contacted by the Army and sought as sources of supply for daylight fluorescent fabric, an urgently needed military material. Among firms such as duPont, Skinners Satin, and the like first contacted by the Army was Celanese-Celluloid Corp., whose president was Mr. Dreyfus. And yet despite the investigation of these firms, the only available source of supply was appellees' first licensee, Continental Lithograph Corporation. It is to be noted that the date of the Historical Data sheet for this military procurement was August 10, 1942. It is respectfully submitted that it would take an extraordinary and positively established fact to justify appellant's assuming, as he necessarily does with respect to Exhibit 6, that, out of mere disinterest, no firms other than Continental Lithograph were reported as sources of supply for the desired daylight fluorescent fabric. In addition to showing that appellees' fabrics were not known to firms skilled in the art who, out of patriotic as well as profit motives, would have been expected to volunteer, if they knew how, as sources of military supply, Exhibit 6 casts another pertinent light on the invention in suit. The genesis of this invention was not in the textile field, where it would have arisen if it were nothing more than an expected development in the art; rather this invention arose from the work of private individuals then associated, as licensors, with a firm in the non-analogous field of lithography. The invention was not only striking and unexpected in its effect and utility; it arose from an unpredictable source outside its field of manufacture and use.

Although the District Court refused to let the witness Switzer recount his conferences with Mr. Dreyfus and the Celanese officials and engineers in connection with the interest of Celanese becoming a supplier to meet the procurements placed with Continental Lithograph Corporation [from which testimony, if it had been offered, it is believed the acknowledgment of appellees' invention by Mr. Dreyfus and his engineers would have been clearly evident], yet there is a document of record which appears to establish, beyond equivocation, the efforts of Mr. Dreyfus' company, Celanese Corporation, to acknowledge appellees' invention. This is the script of a "commercial" from Celanese Corporation's radio program "Greater Moments in Music" for January 19, 1944, appearing as Exhibit B in paper No. 6, File Wrapper of the application in suit (Pl.'s Ex. 1). In this radio broadcast (although mistaken in confusing appellee Switzer's brother Robert with appellee Ward as the co-inventor of daylight fluorescent fabrics), Mr. Dreyfus' company gave credit for the discovery of daylight fluorescent cellulose acetate ("Celanese" is a trademark for cellulose acetate fabric) to "two young scientists[14] associated with Continental Lithograph Corporation, Joseph and Robert Switzer." Celanese Corporation took credit for supplying the fabric given "fluorescent treatment by Continental."

The foregoing conduct by Celanese Corporation clearly seems to refute the inferences of anticipation which appellant tries to make out of the Dreyfus patent.

As to the independent investigation of the novelty of appellees' invention by other branches of the Government, Exhibit 11 and the testimony relative thereto (App. pp. 62-63) shows that the Signal Corps of the U. S. Army conducted a royalty renegotiation proceedings under Public Law 768, with the attendant consideration of patentable novelty, and approved continued payment of royalties by appellees' licensee for daylight fluorescent fabrics purchased for military use. Although the Court indicated such matters had little probative value, the fact remains that the renegotiation was conducted by an officer and lawyer whose duty was to save the Federal Government money by determining what "royalties, if any" [15] were "fair and just." The document has the value of representing the estimate of a then unpatented invention contemporaneously with its first use, as contrasted with appellant's reaction, colored by contact with prospective infringers, many years later.

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[14] The designation of "scientist" was then quite flattering to Joseph Switzer. Although he is now more qualified by experience, Mr. Switzer's formal education stopped upon his graduation from the Berkeley, California, high school a few years before the date of the Celanese broadcast.

If the Court had permitted Mr. Switzer to testify further with respect to the Canadian licensee, Guarantee Silk Dyeing & Finishing Co., the very severe novelty investigation made by the Canadian Government on royalties payable to appellees would have been of record. On the matter of government investigations of novelty it is respectfully submitted that the profferred testimony of Dane with respect to novelty investigations of the British Government would have been admissible. Although Dane did not pretend to be a British barrister, he was a British business man familiar not merely in general with the present practice of the British Government regarding permitted imports of materials covered by foreigners owning British patents on the materials and the payment of royalties out of the realm under licenses granted under such foreign held patents. Rather, Dane was familiar, in particular, with the proceedings which were prosecuted with respect to payment of royalties on daylight fluorescent fabrics in Great Britain and the importation of daylight fluorescent pigments. It would seem that he would have been competent to testify as to the British proceedings in which he was involved.

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[15] Public Law 768, now 35 U. S. C. 89.

While foreign governments have different standards of invention than those domestically required for patentability, nevertheless, due to the fact that such novelty investigations of Britain and Canada relate to payments of sums contrary to general prohibitions upon any transfer of assets out of the realm, the consideration of invention by such governmental bodies is necessarily highly sharpened and is of considerably more probative value than the granting of corresponding patents in such countries, for example. Again, the estimate of invention by the British Government for example, would, it is believed, have made appellant's speculations regarding Colour Index and Abel appeal even more fanciful. Except as excluded testimony regarding acknowledgments of appellees' invention by foreign governments might have been excessively cumulative, if there were any error by the Court below it would appear to have been in the exclusion of such testimony.

THE PROCEEDINGS BELOW.

Appellant's discussion of the proceedings below are on the whole, accurate, in so far as the mere course of proceedings commencing in the Patent Office up to the decree below are related. The appellant's statement, however, in no way reveals the confusion of the Patent Office in the continually shifting attack upon the claims in suit. Such confusion may account, in part, for the apparent failure, even yet, of appellant to appreciate appellees' invention. The succession of several Examiners in the Patent Office prevented any continuous prosecution or consideration. Until just before final rejection, each action brought a further citation of references adding to the volume and constituting a tacit admission that previously cited references were not adequate. The Board of Appeals, faced with a heavy record, practically parrotted the Examiner, even to the extent of repeating obvious errors of the Examiner (App. p. 163), such as citing theories of the Examiner based on a 1946 publication cited against this application filed in 1942. For example, in the final rejection, the Examiner criticized a certain affidavit with respect to a French patent, alleging that the affidavit did not report a test of a certain alternative example in that foreign reference. The Board of Appeals, in both its original and reconsidered decision, repeated that criticism. A considerable part of the trial below was occupied by appellees in demonstrating to the Court, as had repeatedly been protested to the Board of Appeals and the Examiner, that the affidavit in question related to the very example for which the Examiner had criticized the affidavit for allegedly not reporting! (App. pp. 74-85.)

In the nearly ten years of prosecution of the application in suit, appellant and the Patent Office have never been able to set up a consistent line of attack upon the claims in suit, revealing further the uncertainty of appellant. The most consistently applied reference has been the manifestly inadequate British patent to Abel. This was cited by the Examiner in the first action but by the time of the Examiner's Statement on appeal to the Board of Appeals, it had become secondary, at least, to a French patent No. 579,896 to Rhodiaseta. Appellant relied heavily on the French Rhodiaseta patent in the Court below, but since the Court below mentioned the Rhodiaseta patent specifically in its Memorandum Opinion as being inadequate, that reference, once the bell-wether, is not even mentioned in the brief.

Even at this appellate stage, appellant is not familiar with the record in the case. On page 4 of the appellant's brief it is stated that two references "not previously cited or relied upon" were called to the Court's attention at the start of the trial below. These references were Dreyfus and Colour Index and actually were only two of four unpleaded so-called references sprung at commencement of trial. The two other items were obviously incompetent because published after the filing of the application in suit and were withdrawn at the end of the trial. Appellees' complaint regarding the citation of Dreyfus and Colour Index at the commencement of the trial is not only as to the element of surprise involved, but that such recitation represented another instance of inconsistent opinion and the dragging up of matter which had presumably become water over the dam.

And in this appeal, appellant even criticizes the Court below for accepting and believing appellees' reports of tests of the prior art! This now major ground of attack is directed especially to the tests of the Dreyfus reference. Appellant alleges that the reported tests of the Dreyfus dyeing (Ex. 5-B) are incomplete because "the final rinsing step was not performed." (Br. p. 13). It is true that Exhibit 5-B was not rinsed after drying, but, as apparent on the face of the record (App. p. 195, last sentence, first paragraph) rinsing is not a required step in the Dreyfus process but only an optional "after treatment." The test by which Exhibit 5-B was produced is, thus, not incomplete. Further, *appellant is estopped on the record* from now asserting that the Court below erred in accepting and believing appellees' testimony with respect to the tests in question. Appellant's solicitor has apparently forgotten that just before final argument before the trial Court, appellees came prepared with suitable equipment to perform the optional after treatment in open court. Appellant having sprung the reference at the commencement of trial, appellees were naturally not earlier fully equipped to perform optional experiments. As shown by page 138 of the Appendix, the Court commented with respect to comparative tests of Exhibits 5-A (Abel), 5-B (Dreyfus) and 5-C (appellees). The Court stated that it did not believe they were vital to the case, although indicating that if it appeared they were, the Court would allow the tests to be performed even though the case was technically closed. Appellant's solicitor concurred with the Court, stating:

> Mr. Schimmel: "I do not believe it is vital to the case, either." (App. p. 138.)

Appellant now seeks to assert, as a point on appeal, a matter in which he concurred with the opinion of the Court below as being not important to the case!

REBUTTAL OF ARGUMENT.

(a) METHOD CLAIMS:

Most of the arguments against the District Court's finding of patentability of appellees' method claims have been answered in detail above. To answer a further minor criticism, claims 6 and 16 are criticized because claim 6 does not recite a temperature limitation for the flushing water and claim 16 does not mention that the fabrics, to be flushed, are to be flushed with water (Br. pp. 10, 17). As to this broad claim 6, admittedly it is not limited to the temperature of the flushing water, but since the specification repeatedly points out the danger of coalescence of the fabric if the flushing water is too warm, it would be apparent to those skilled in the art that, in the broad definition of the invention, suitable judgment, as directed by the specification, should be exercised. As for the criticism of claim 16, it is actually a criticism of possible redundancy in the other claims which mention "flushing with water." Merriam Webster's Dictionary defines the intransitive verb "flush" as meaning "To draw water from, or pour it over or through (a pond, meadow, sewer, etc.); to wash out by a rush of water." Other dictionaries likewise define "flush" as inherently meaning with water.

In general the error of appellant's attacks upon the method claims on appeal lie in the assumption that because a dye capable of daylight fluorescence can be found in one reference and various process steps can be found individually or in different order in several other references, appellees' claims are met. If appellant's solicitors will recall, and as is evident from the Memorandum Opinion, it was the matter of major concern to the District Court below whether, as a matter of law a valid method claim can issue when the method steps can be found separately in various references or in different order in other references. The District Court requested counsel to furnish memoranda on this point of law. The answer, as brought out in authorities cited by the Court in its opinion and needing no repetition here, is that such method claims are patentable and valid in law, *provided* it is found as a fact that new and useful results are attained and skill beyond that expected in the calling is involved in so combining or rearranging prior art method steps.

Since the District Court found most emphatically, as a fact, that inventive skill (answering to the highest standards of invention) was involved by appellees in inventing their method, and since the foregoing detailed analysis of the prior art with respect to appellees' method shows that the appellant's contentions with respect to the prior art are based only on speculation which is blind to the evidence of record, the District Court's finding of fact is not only "not clearly erroneous" but thoroughly warranted. The District Court's finding of fact must, therefore, not only stand, but its consequent conclusions of law must also stand.[16]

(b) COMPOSITION CLAIMS.

As noted above, the only attack leveled at the composition of matter claims, i.e. claims 11 to 15 inclusive, is that the claims are functional. This is a criticism which did not clearly arise in the Patent Office until the Board of Appeals' decision; even then the Board did not seem to criticize the limitation, to which appellant now objects, so much as being functional and indefinite but as not adding "anything in the way of clarity to the definition of the composition claimed" (App. p. 174). At no time in the trial Court below did appellant question the technical sufficiency of appellees' composition claims.

In the first place, just as appellant is estopped to criticize the Court's satisfaction with the sufficiency of the comparative tests of the prior art, so should appellant now be estopped to bring up a line of attack which was dropped and not urged in the Court below. Further, and this is where some limit should be put on the endless shifting in the grounds for refusing appellees' patent, by not raising the criticism of functionality until decision by the Board of Appeals, appellees were denied the opportunity, if it were ever needed, of amending their claims to draw them in a more satisfactory form technically.

In the second place, and conclusively, the claims themselves, in their present form, are sanctioned by the language in *General Electric Co. v. Wabash Appl. Co.*, 304 U. S. 364, the very authority which appellant cites as grounds for criticizing the claims. On page 17 of the brief, appellant states that the "vitalizing language of the claims are the words:

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[16] *Standard Oil Development Co. v. Marzall* [U. S. App. D. C. 1950], 181 F. 2d, 280, 283.

> 'said dye being so arranged and orientated in said filaments of said fabric that said fabric exhibits daylight fluorescence.' "

If Claim 11, for example, had been examined more carefully, it would have been apparent that the claim calls for a composition of matter comprising (1) a fabric of organic filaments and (2) a daylight fluorescent dye of stated characteristics "dispersed" in said filaments. As evident from the specification (App. p. 142) it is the word "dispersed" which is the vitalizing term in the combination which defines the physical relationship of the dye in the filaments from which the result of daylight fluorescence flows. The distinction over prior art dyed filament structures resides therein, as pointed out above. The phrase to which appellant objects simply tells those skilled in the art the result which flows from having the dye thus dispersed. In dealing with consequences of molecular dispersions, appellees are dealing with structures which cannot be picked apart and weighed in the hand, as parts of a machine, but structures which are none the less real, for they may be measured and determined by even simple tests, such as the heating to separate out the subtractive colors, as discussed above. It was undoubtedly claims to compositions of matter of the general chemical and physical class such as the present one which the Supreme Court had in mind when it stated in the *General Electric* case:

> "A limited use of terms of effect or result, which accurately define the essential qualities of a product to one skilled in the art, may in some instances be per-

> missible and even desirable, but a characteristic essential to novelty may not be distinguished from the old art solely by its tendency to remedy the problems in the art met by the patent." (304 U. S. 364, 371.)

Manifestly claims of the style of appellee's composition claims are not only not condemned by the Supreme Court but sanctioned and approved. The distinction of appellees' fabrics over the prior art does not reside solely in the phrase which appellant now argues as being technically insufficient.

CONCLUSION.

Throughout its brief, appellant, as revealed by its attacks upon the findings of the Court below by way of speculation, seems to assume, out of his customary role as appellee before this Court, that appellees still have the burden of overcoming the presumption which once arose out of the fact that the Patent Office has refused a patent on appellee's application. Appellees have shown that they properly overcame that burden in the Court below. The burden is now on appellant to show that the Court below had no justification of record for its findings in its manifestly carefully considered opinion and judgment. Appellant has not met that burden and cannot meet it with bare speculations or dissatisfaction with the District Court's estimate of the witnesses' credibility. The judgment of the Court should be affirmed by dismissing this Appeal.

Respectfully submitted,

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REPLY BRIEF FOR APPELLANT

United States Court of Appeals

DISTRICT OF COLUMBIA CIRCUIT

APPEAL NO. 10985

JOHN A. MARZALL, COMMISSIONER OF PATENTS,
APPELLANT

v.

JOSEPH L. SWITZER AND RICHARD A. WARD, APPELLEES

APPEAL FROM THE JUDGMENT OF THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA CIRCUIT

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REPLY BRIEF FOR THE COMMISSIONER OF PATENTS

At the outset in making a reply to the arguments advanced in appellees' brief, appellant is compelled to point out that, except for the first two paragraphs of the jurisdictional statement, the first nine pages of the brief refer to matters which are clearly improper, irrelevant and immaterial to the decison of the issues raised by this appeal. Admittedly, this matter is outside the record of this case (Appellees' brief 5). Hence, on its face, it is not properly in appellees' brief. A mere inspection thereof will show clearly its irrelevancy, immateriality and impertinence.

Notwithstanding that appellant feels certain that this Court will ignore this matter in arriving at its decision, nevertheless, appellant for the record enters a denial of the numerous innuendoes interspersed therethrough that the conduct of appellant and of his counsel in this case in taking this appeal was improper and motivated by something other than the public interest. Any and all such intimations which have been incorporated in this portion of the brief and woven into the pattern of the argument elsewhere in the brief are herewith categorically denied, both individually and collectively.

Considering appellees' attack upon the prior art relied upon by appellant, it is noted that there is frequent allusion (Br. 20) to the fact that three of the four references are foreign publications, and the statement is made that "this and other Courts have repeatedly pointed out that a foreign reference is not competent and anticipatory where experimentation is required, as by substituting suggested alternatives in specific examples" (Br. 22). Appellant takes issue with this statement of the law, and accordingly presents herewith a resumé of the rulings of this Court and other courts on this question.

The law relating to foreign publications or patents as references against a claimed invention is said to stem from Seymour v. Osborne, 11 Wall. 516, wherein the

Supreme Court held the defense of invalidity of the patent in suit because described in a foreign publication not made out unless it is shown that

> "the description and drawings (of the foreign publication) contain and exhibit a substantial representation of the patented improvement in such full, clear and exact term as to enable any person skilled in the art or science to which it appertains to make, construct and practice the invention."

It is interesting and important to note that the Court used the expression "substantial representation", not exact representation. Under the rule so announced, this Court in In re Ek, 57 App. D. C. 203, 19 F. 2d 677; Becket v. Coe, 69 App. D. C. 51, 98 F. 2d 332; and Baldwin-Southwark Corp. et al. v. Coe, 76 App. D. C. 412, 133 F. 2d 359, held that foreign patents are valid references when there is a clear disclosure of the invention sought to be patented in the United States, and that such disclosures are to be measured not by what may be made out of them, but by what is clearly and definitely expressed therein.

The Court of Customs and Patent Appeals, whose decision in In re Cross was apparently approved by this Court in Becket v. Coe, supra, said in that case (In re Cross, 20 CCPA 710, 62 F. 2d 182) that

> "We know of no rule relating to foreign patents when used as references which requires that every element and feature of the claims in the patent application shall be clearly shown in such foreign patent."

This holding was referred to in In re Mulligan, 23 CCPA 1220, 83 F. 2d 917; and still later in In re Sherman, 26 CCPA 1337, 104 F. 2d 619, the Court said:

> "Upon the question of the weight to be given a foreign patent cited as a reference, whatever else may be said, it is well settled that it is not required that the patent describe the identical thing in order to be a reference, and where there is a difference the question of whether such difference involves invention or mere mechanical skill must be considered."

Furthermore, that Court has held that foreign patents may be combined with others for what is clearly shown therein—In re Cross and In re Sherman, both supra—, a rule which appears to express the same thought as that of this Court in Davies v. Coe, 65 App. D. C. 345, 346, 83 F. 2d 602, where certain claims were held patentable over a combination of a foreign patent and a United States patent.

Of the cases cited by appellees (Br. 20) in support of the rule that a foreign reference is not competent where experimentation is required, as by substituting suggested alternatives in specific examples (Br. 22), it should be noted that not a single case makes any reference to suggested alternatives in specific examples. Furthermore, all the cases are in accord that if the foreign publication or patent is so clear and explicit that it teaches the subject matter claimed it operates as an anticipation. As pointed out in the Wisconsin Alumni Case, 85 F. 2d 166, 167, where the foreign publication relied upon contains mere vague and general representations which are not enough, without the necessity of experimentation, to teach the claimed invention, then such a publication fails as an anticipation. This rule of experimentation as a measure of the anticipatory value of a foreign publication is further brought out in the Hollywood-Maxwell Co. Case, 183 F. 2d 261, 263, where the Court reviewed the rule respecting foreign disclosures as anticipations, and held that such disclosures are valid if the teaching is clear and explicit without further experimentation; that precise identity between claims and specification of a domestic and foreign patent is not required; that substantial identity is sufficient, and that the experimentation must be more than the work of a mechanic. Furthermore, as clearly pointed out in that case, even assuming that the foreign patent does not, when read within its four corners, disclose the claimed invention with sufficient clarity to invalidate, nevertheless, it is not incompetent as a part of the prior art to negative invention in the subject matter of the claims.

Accordingly, it is submitted that foreign patents are just as effective as references as other patents for what they clearly show or for what those skilled in the art can be expected to have been taught thereby, and that such patents, if clear and definite, are part of the prior art and may be combined with other prior disclosures to negative invention and patentability in the claims of a patent application.

Applying the above rule of law respecting foreign patents to the facts of the instant case, it is submitted that it is crystal clear that only ordinary skill is involved in utilizing the fluorescent rhodamine dye disclosed in the Abel British patent in any of the specific examples of that patent, and that that amount of experimentation, assuming that it is experimentation, is within the skill of the art and is permissible under the rule enunciated above. Hence, since the trial court found that the materials and steps utilized by appellees are disclosed in the prior art, it would appear that the Court erred in its evaluation of these foreign disclosures and in failing to recognize as a matter of law that these disclosures are valid as anticipations or as negativing invention for everything clearly disclosed therein.

Appellees question the right of appellant to raise the issue of functionality with respect to the composition-article claims, i.e., claims 11 to 15, inclusive, stating that this is a belated attack upon the technical sufficiency of the claims which was not urged in the Court below and that appellant should be estopped to raise this issue (Br. 39). Apart from the fact that appellant's counsel recollects that he did urge this ground of rejection in final argument—which was not reported (App. 137)—, it should be noted that under the rule of Hill v. Wooster, 132 U. S. 693, this Court should not authorize the issuance of a patent containing certain claims unless it finds affirmatively that the claims are in fact patentable. Further, this Court has laid down the rule that in determining patentability, the Court must consider any material brought to its attention, whether or not the decision of the Patent Office was based thereon. Knutson v. Gallsworthy, 82 U. S. App. D. C. 304, 306-308, 313-14, 164 F. 2d 497; Radtke Patents Corp. v. Coe, 74 App. D. C. 251, 270, 122 F. 2d 937, cert. denied 314 U. S. 695.

On the merits of these claims, appellees contend that the vitalizing feature is the definition of the daylight fluorescent dye "dispersed" in the fabric filaments (Br. 40) and that the ability of the dyes to exhibit the claimed effect, i.e., daylight fluorescence, depends upon the distribution and spacing of the dye molecules in the fiber (Br. 14). However, the claims are silent as to what that distribution or spacing is. While it is true that the witness stated that "uniform" distribution throughout the filament (App. 30) creates the desired effect, it is emphasized that the claims state only that the dye is so arranged and oriented in the filaments that the fabric exhibits daylight fluorescence. Admittedly, this matter of distribution is the point of novelty. Unless the claims clearly specified the uniform distribution, it is clear that they fall squarely within the condemnation of the Supreme Court in General Electric Co. v. Wabash Appliance Corp., 304 U. S. 364, that a characteristic essential to novelty may not be distinguished solely by functional language. Since these claims do not meet the statutory (R.S. 4888) requirement for particularity and definiteness, under the rule of the General Electric Case, it is necessary for this Court to pass upon that issue and to adjudge whether appellees are entitled, according to law, to receive a patent for the subject matter of claims 11 to 15, inclusive.

With respect to appellees admission (Br. 37) that method claim 6 is not limited to the temperature of the flushing water, it is noted that the argument is advanced that it would be apparent to those skilled in the art, in view of the specification, to exercise suitable judgment to avoid a temperature which would coalesce the filaments of the fabric. Since claims are to be read separately from the specification—Graver Tank et al. v. Linde Air Products, 336 U. S. 271—and since, in a proceeding to obtain a patent, claims are read broadly and limitations not expressly stated are not read therein, it is submitted that appellees argument is without merit. The rule is well established that the claims must recite all necessary and essential limitations—In re Crowell, 23 CCPA 1246, 84 F. 2d 206; In re Seabury, 23 App. D. C. 377—and that limitations of the specification will not be read into the claims. As set forth by this Court in Seyforth v. Coe, 76 App. D. C. 96, 129 F. 2d 58:

> "we are not at liberty as appellant suggests to fill out the deficiency in the claim by reference to the application or to other claims not before us."

Under these circumstances, it is suggested that appellees' claims (claims 6 and 16) stand self-condemned and allowance thereof by the trial court was clearly erroneous.

Appellant earnestly contends that the judgment of the District Court is not supported by the evidence or by the law which should govern this case, and accordingly submits that the judgment should be reversed and the case remanded with instructions to dismiss the complaint.

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